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ABSTRACT

The Title I Umbrella Program provided compensatory instruction in reading, mathematics, and writing to 24,000 mildly or moderately handicapped students in New York City. The program was comprised of seven discrete components for the remediation of reading and writing skills, five after-school models, and two components for the remediation of math skills in a variety of school settings (integrated public schools, special public schools for handicapped students, and non-public schools). Individual components were distinguished by: (1) the type of school served; (2) the size of Title I eligible handicapped population in these schools; (3) the characteristics of the target students; (4) instructional approach; and (5) the instruments used to evaluate pupil achievement and program implementation. Evaluation of the program is based upon quantitative data on pupil achievement and qualitative data on program implementation. Chapters two through six present the findings of the five components that served students in integrated public schools. Chapters seven and eight present the findings for the Special Schools Model and the Non-Public Schools Model respectively. Chapter nine presents the findings for the Prescriptive Math Model, which operated in integrated public schools, and chapter ten presents the findings for the five after-school components. Conclusions and recommendations are stated in the final chapter, and student achievement scores within each content area of the program components are reported in data tables. (Author/JCD)

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FINAL EVALUATION REPORT

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TITLE I/PSEN
INDIVIDUALIZED READING
AND MATH SERVICES
FOR THE HANDICAPPED
1980-81

The Division of Special Education
Alan Gartner, Executive Director

DSE Reimbursable Programs
Allison Tupper

DSE Reimbursable Finance Office
Alan Friedman

Prepared by:

OEE Special Education Evaluation Unit
Robert Tobias, Evaluation Manager
Fred Reichman, Consultant
Frances Francois, Consultant

UD022069

NEW YORK CITY PUBLIC SCHOOLS
OFFICE OF EDUCATIONAL EVALUATION
Richard Guttenberg, Administrator

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A SUMMARY OF THE EVALUATION FOR THE 1980-1981 TITLE I/PSEN INDIVIDUALIZED READING AND MATH SERVICES FOR THE HANDICAPPED PROGRAM

This program provided compensatory instruction in reading, mathematics, and writing to approximately 24 thousand Title I-eligible mildly and moderately handicapped students in a wide variety of school settings: integrated public schools (those in which special-education classes and regular-education classes coexist); special public schools for handicapped pupils; and non-public schools. The program was comprised of seven school-day models for the remediation of reading and writing skills and two school-day models for the remediation of mathematics skills. In addition, there were five after-school models, organized during mid-year, which served eligible students not enrolled in the school-day models; two employed a peer-tutoring paradigm and three were direct-service models.

All of the school-day models employed a diagnostic-prescriptive approach in the context of a pull-out structure. These models were distinguished by (1) the type of school served, (2) the size of the population served, (3) the characteristics of the target students, (4) instructional approach, and (5) the instruments used to evaluate pupil and program achievment.

Quantitative analysis of pupil achievement indicate that, overall, 75 percent of the program's total population attained the criteria established for their respective models in reading; 72 percent achieved the criteria in math. Six of the seven school-day reading-remediation models attained their proposed objectives; one of the two school-day mathematics-remediation models attained its objective. We conclude, therefore, that the school-day models provided effective remediation which resulted in students' mastery of specific reading and math skills at or above proposed criterion levels. Specifically, the findings for the school-day models indicate the following:

-- although at the time of data collection 71 percent (compared to the goal of 75 percent) of the students in the Prescriptive Reading Model (which served approximately 70 percent of the Umbrella's population) had attained the five-skill criterion, it was projected that, at the end of the funding year, the model's objective would have been achieved;

-- the proposed reading objectives for the Learning to Read Through the Arts, Bridge to School, and Non-Public Schools Models were surpassed;

-- while approximately 45 percent of the students of the Bilingual Model, as a result of late admission, had incomplete data, the program objective was attained for those students who attended the full year;

-- the objectives for the Special-Schools Model were attained in reading and writing, but not in mathematics;

-- the objective for the Prescriptive Math Model was attained at the proposed criterion level; and

-- the objective for the Oral Approach to Communication Model was not attained.

Findings about the effectiveness of the after-school models are not as positive as those for the school-day models. The peer-tutoring after-school models in the Manhattan and Queens Regions achieved their reading objectives set for tutors; the objectives set for tutees, however, were not attained. Only one of the direct-service after-school models (Model D, Brooklyn West Creative Writing) attained its objective. The objectives were not attained for Model C, Brooklyn East Reading or Model E, Staten Island Math. The principal reason for the limited success of the after-school models was late start-up and hasty planning. Although, delayed program approval of the after-school models may have made these problems unavoidable, we strongly recommend that future replications should not be attempted without sufficient lead time for planning.

The success of the school-day models is attributed to: the effective planning and implementation of a systematic, individualized diagnostic-prescriptive methodology; the timely delivery of a wide variety of instructional supplies; innovative instructional strategies typified by the Learning to Read Through the Arts Model; an effective program of in-service training; and the sincerity, dedication, and skill of most staff members.

The following recommendations are aimed at improving the overall effectiveness of the program: replacement of the pull-out strategy employed in all of these models by a more integrated model; increased parent involvement; the possible deletion of services for highly transient populations; the purchase of high-interest/easy-readability materials for older students; better communication between remedial-reading and classroom teachers; and more intensive planning and better organization for the Bilingual Model.

CONTENTS

I. INTRODUCTION..... 1

II. PRESCRIPTIVE READING MODEL..... 5

DESCRIPTION..... 5

QUALITATIVE EVALUATION..... 5

QUANTITATIVE EVALUATION..... 10

III. LEARNING TO READ THROUGH THE ARTS..... 31

DESCRIPTION..... 31

QUALITATIVE EVALUATION..... 32

QUANTITATIVE EVALUATION..... 33

IV. BRIDGE TO SCHOOL..... 44

DESCRIPTION..... 44

QUALITATIVE EVALUATION..... 44

QUANTITATIVE EVALUATION..... 44

V. ORAL APPROACH TO READING..... 50

DESCRIPTION..... 50

QUALITATIVE EVALUATION..... 50

QUANTITATIVE EVALUATION..... 52

VI. BILINGUAL HANDICAPPED..... 59

DESCRIPTION..... 59

QUALITATIVE EVALUATION..... 59

QUANTITATIVE EVALUATION..... 60

VII. SPECIAL SCHOOLS..... 66

DESCRIPTION..... 66

QUALITATIVE EVALUATION..... 66

QUANTITATIVE EVALUATION..... 68

VIII. NON-PUBLIC SCHOOLS..... 89
DESCRIPTION..... 89
QUALITATIVE EVALUATION..... 89
QUANTITATIVE EVALAUTION..... 90
IX. PRESCRIPTIVE MATH..... 95
DESCRIPTION..... 95
QUALITATIVE EVALUATION..... 95
QUANTITATIVE EVALUATION..... 97
X. AFTER-SCHOOL MODELS..... 107
PEER-TUTORING MODELS..... 108
DIRECT-SERVICE AFTER-SCHOOL MODELS..... 120
XI. CONCLUSIONS AND RECOMMENDATIONS..... 129
SCHOOL-DAY MODELS..... 130
AFTER-SCHOOL MODELS..... 134

LIST OF TABLES

TITLE		Page
Table 1.	Relative percent of specific disability groups within the six special education regions.....	12
Table 2.	Frequency distribution of total reading skills mastered by students in the prescriptive reading model (as measured by the ICRT).....	18
Table 3.	Summary of student achievement by reading component (N = 11,397).....	19
Table 4.	Metrix of correlations (r) and percentages of shared variance (r^2) between descriptive variables and reading achievement measures.....	22
Table 5.	Breakdown of four measures of reading achievement by region.....	23
Table 6.	Breakdown of four measures of reading achievement by the four principal disability groups.....	26
Table 7.	Percentage of variance in total mastery, percent of mastery, and rate of mastery accounted for by sessions attended, disability, and region.....	30
Table 8.	Frequency distribution of the number of total reading skills mastered by students in the LTRTA model (as measured by the WDSDT).....	37
Table 9.	Comparison of mean number of skills mastered among all pairs of disability groups (Newman-Keuls Procedure).....	41
Table 10.	Comparisons of mean learning rate among all pairs of disability groups (Newman-Keuls Procedure).....	42
Table 11.	Comparisons of mean percentage of skills mastered among all pairs of disability groups.....	43
Table 12.	Frequency distribution of the number of reading skills mastered by students in the Bridge to School (as measured by the CRT).....	48
Table 13.	Frequency distribution of the total reading skills mastered by students in the Oral Approach to Reading Model (as measured by the IPMS).....	56
Table 14.	Mean number of reading skills mastered by disability.....	57

TITLE	Page
Table 15. Frequency distribution of the Number of reading skills mastered by students in the Bilingual Model (as measured by the LEAMOS).....	63
Table 16. Frequency distrubiton of the number of reading skills mastered by the Bilingual Model (as measured by the LEAMOS).....	64
Table 17. Frequency distrubtion of the number of skills mastered for each six weeks of instruction by the special-schools students (as measured by the Fountain Valley).....	72
Table 18. Frequency distrubition of the total number of reading skills mastered by the special-schools students.....	73
Table 19. Percentage of students mastering skills and the mean number of skills mastered by reading component.....	74
Table 20. Compairsons of the adjusted mean number of reading skills mastered among five disability groups (Newman-Keuls Procedure).....	75
Table 21. Frequency distribution of the number of reading skills mastered by the special schools students (as measured by the Key Math).....	79
Table 22. Percentage of students that mastered skills by topic.....	80
Table 23. Comparisons of the adjusted mean number of math skills mastered among the five disability groups (Newman-Keuls Procedure).....	82
Table 24. Frequency distribution of the number of writing skills mastered by the special-schools students.....	84
Table 25. The percentage of students mastering skills by writing component.....	86
Table 26. Comparisons of adjusted mean total writing skills mastered among four disability groups (Newman-Keuls Procedure)....	87
Table 27. Frequency distribution of the total number of reading skills mastered by the non-public school students (as measured by the WDSDT).....	94
Table 28. Frequency distribution of the total number of reading skills mastered by the Prescriptive Math Students (as measured by the Key Math Test).....	101

TITLE	Page
Table 29. Percentage of students mastering skills by content areas..	102
Table 30. Breakdown of three achievement measures by region.....	104
Table 31. Breakdown of three achievement by disability.....	106
Table 32. Frequency distribution of the number of total reading skills mastered by the Manhattan after-school tutors and tutees.....	114
Table 33. Frequency distribution of total reading skills mastered by the Queens after-school tutors (as measured by the Fountain Valley).....	118
Table 34. Frequency distribution of total reading skills mastered by the Queens after-school tutees (as measured by the Fountain Valley).....	119
Table 35. Frequency distribution of total reading skills mastered by the Brooklyn East after-school students (as measured by the ICRT).....	123
Table 36. Frequency distribution f the total number of writing skills mastered by the Brooklyn West after-school students (as measured by the Readers' Digest Writing Test).....	125
Table 37. The percentage of students in the creative-writing model mastering skills by topics.....	126
Table 38. Frequency distribution of the total number of math skills mastered by the Staten-Island after-school students (as measured by the Key Math Test).....	128

LIST OF FIGURES

TITLES		Page
Figure 1.	Mean total sessions offered, total sessions attended, and percentage attendance for the six special-education regions.....	14
Figure 2.	Cumulative frequency distribution of total skills mastered by the Prescriptive Reading Model students (as measured by the ICRT).....	16
Figure 3.	Cumulative frequency distribution of total skills mastered by the Learning to Read Through the Arts Model students (as measured by the WDSDT).....	36
Figure 4.	Plot of mean number of sessions required to master one new skill by total sessions attended for LTRTA students..	39
Figure 5.	Cumulative frequency distribution of total reading skills mastered by students in the Bridge to School Model (as measured by the CRT).....	47
Figure 6.	Cumulative frequency distribution of the total number of reading skills mastered by studentss in the Oral Approach Model (as measured by the IPMS).	
Figure 7.	Cumulative frequency distribution of the total number of reading skills mastered by students in the Bilingual Model (as measured by the LEAMOS).....	62
Figure 8.	Cumulative frequency distribution of the number of reading skills mastered for each six weeks of instruction for the Special-Schools students (as measured by the Fountain Valley).....	71
Figure 9.	Cumulative frequency distribution of the total math skills mastered by the Special-Schools students (as measured by the Key Math Test).....	78
Figure 10.	Cumulative frequency distribution of the total reading skills mastered by the Non-Public School students (as measured by the WDSDT).	
Figure 11.	Cumulative frequency distribution of total math skills mastered by the Prescriptive Math Model students (as measured by the Key Math Test).....	100

I. INTRODUCTION

This report presents a comprehensive evaluation of the Title I and PSEN Individualized Reading and Math Services for Handicapped Students Program (hereafter referred to as the Umbrella) for 1980-81. The Umbrella was comprised of seven models (discrete component programs) for the remediation of reading and writing skills and two models for the remediation of math skills in a wide variety of school settings, including: integrated public schools (those in which special-education classes and regular-education classes are housed in the same school); special public schools for handicapped pupils; and non-public schools. In addition to these models, which operated during the regular school day, the Umbrella was expanded during the spring semester through the establishment of five after-school models. In total, the Umbrella served approximately 24 thousand handicapped students during the 1980-81 school year--more than double the population served during the previous funding year.

The models of the Umbrella were distinguished by (1) the type of school served, (2) the size of the Title I-eligible handicapped population in these schools, (3) the characteristics of the target students, (4) instructional approach, and (5) the instruments used to evaluate pupil and program achievement. This report has been organized to reflect both the structure of the Umbrella and the distinctions among the models. That is, separate chapters have been allocated to describe each model and present the findings of the analyses of qualitative and quantitative data gathered for their evaluation. Moreover, the descriptive and analytic content included in each chapter was selected to portray the salient characteristics of each model.

In addition to the distinctions among these models, however, it is important to note the commonalities. Without exception, the instructional methodology employed by each model was of the individual diagnostic-prescriptive variety. The essential characteristics of this approach are (1) diagnostic assessment of each pupil's academic strengths and weaknesses (in reading or math) through criterion-referenced testing, (2) the selection of specific instructional objectives for each student based upon the results of the diagnostic tests, (3) the selection of materials and the implementation of instructional strategies appropriate to the accomplishment of each student's instructional objectives, and (4) individual posttest assessment to determine whether each child's instructional objectives have been attained. The elements of this four-step approach are documented in each student's individual record. Furthermore, all of the models employed a pull-out approach. That is, individual students were pulled out of regular classes to receive remediation either individually or in small groups.

The evaluation of the Title I Umbrella was based upon both quantitative data on pupil achievement and qualitative data on program implementation. The latter were gathered through visits by OEE-trained field consultants to a representative sample (50 percent) of the sites of each model. The consultants reported these data on interview and observation forms designed for this purpose. The interviews and observations took place between November, 1980 and June, 1981. The total number of sites visited was 204; 251 interviews were conducted.

Quantitative data concerning pupil achievement were obtained through ongoing criterion-referenced testing and reported for analysis by individual teachers on OEE-designed data retrieval forms. In addition, to determine

whether relationships existed between pupil achievement and selected descriptive variables, the data retrieval forms were designed to capture pupil age, disability, attendance, and school level and location.

The organization of this report, by chapter, is as follows:

-- Chapters 2 through 6 present the findings for the five models that served students in integrated public schools. The order of presentation was determined by the relative size of the population served.

-- Chapter 7 presents the findings for the Special Schools Model, which provided its students with mathematics and writing instruction in addition to remediation in reading.

-- Chapter 8 presents the findings for the Nonpublic Schools Model.

-- Chapter 9 presents the findings for the Prescriptive Math Model, which operated in integrated public schools.

-- Chapter 10 presents the findings for the five after-school models.

The final chapter, chapter 11, states the conclusions and recommendations, based upon the analyses of both qualitative and quantitative data, for the Umbrella, in general, and the models, in particular.

It should be noted that the analyses applied to the data for each model were not uniform; rather, they varied as a function of the characteristics of the model and the type of data collected. For instance, due to the large number of students enrolled in the Prescriptive Reading Model (Chapter 2), inferential analysis to ascertain statistical significance was not applied; all changes and differences were real. Accordingly, the importance or meaningfulness of these changes and differences was discussed.

The design of the Umbrella and the organization of this evaluation report tempt the reader to use these data to make comparative judgments concerning

the relative effectiveness of these models. However, the reader is cautioned that use of these data for comparative evaluation would be both inappropriate and spurious since the models differed in (1) evaluative instruments, (2) criteria for objectives, (3) target populations, and (4) total instructional time. Thus, the only appropriate generalizations which may be drawn from these data concern the effectiveness of each model, as implemented, in attaining its proposed objective, and the overall effectiveness of the Title I Umbrella for the handicapped.

II. PRESCRIPTIVE READING MODEL

DESCRIPTION

The Prescriptive Reading Model was designed to improve the reading skills of approximately 15,000 eligible handicapped children in grades three to 12 through individual and small-group remediation. The model employed a pull-out paradigm with each teacher-paraprofessional team serving a total of 45 eligible students. A diagnostic-prescriptive instructional methodology was used based on computer profiles from the administration of the Individualized Criterion Reading Test (ICRT).

The Prescriptive Reading Model was regionally administered by program coordinators; that is, each of six special-education regions had its own Title I coordinator. In addition, within each region, there was an assistant coordinator and teacher trainer who developed and implemented workshops for the training and supervision of program teachers and paraprofessionals.

Under the Umbrella, this was by far the largest of the models; it served approximately 71 percent of the approximately 21,000 handicapped students who received Title I reading remediation during the 1980-81 school year.

QUALITATIVE EVALUATION

Physical Setting, Equipment, and Supplies

The physical settings of this model included regular classrooms, Title I resource rooms, offices, and various other types of space. Well over half of the classes were held in offices or other facilities such as converted nurses' rooms, cubicles, storage rooms, and converted

teachers' lounges. While the majority of the rooms were well-situated, others were not easily accessible--an inconvenience which can be a hardship for some handicapped students.

Most of the facilities were well equipped with supplies, hardware, and books. Most teachers received these supplies as ordered, although some 12 percent said that the failure to receive ordered supplies adversely affected their programs. Sites in which the students exhibited a wide range of functioning, thereby necessitating the use of a large variety of instructional materials, were most seriously hampered by delivery problems.

Field consultants reported that nearly all rooms were well organized with clearly defined student work areas, and equipment and supplies arranged and stored in orderly fashion. The goals of the program were graphically reflected on bulletin boards with examples of students' work. For the most part, student record folders and test profiles were available and up to date. Often, the atmosphere of the classes was enhanced by the structure of the room itself: particular areas were set aside for students to work on different projects comfortably and quietly. At several sites, however, the classrooms were not suited to the goals of the program. In some cases the rooms had been hastily converted and clearly were inappropriate for the program. Some rooms were called cubicles, and were exactly that. They were dreary, windowless spaces that could not be decorated, and were inappropriate for conducting lessons. There were noise distractions because doors had to be left open for ventilation. It is to the credit of the teachers in these situations,

that most attempted to make the rooms as attractive as possible.

Instructional Activities

At each site, remediation was provided by a teacher who was assisted by a paraprofessional (educational assistant). A variety of teaching styles were used, geared to the content of the lessons, the level of students' abilities, and the number of students present. Generally, there was some type of total group instruction, followed by individual attention. Depending upon the content of the lessons and the size of the group, students may have been divided into two or more small groups. Integral to the instructional methodology was the employment of a reward system to reinforce both academic learning and appropriate behavior.

Paraprofessionals performed a variety of functions. In the majority of instances, they tutored individual students. In addition, they were observed working with small groups of students on a project or lesson, and, in a few instances, performing clerical work on student records.

The materials used and the lessons themselves generally corresponded to the short-term objectives listed in the students' individual educational plans (IEPs). However, some teachers indicated that some of the materials were either too mature or too advanced for the social-age levels of some students. Particularly, low-level/high-interest materials were in short supply.

A wide variety of materials were observed in use: audio-visual equipment, books, rexographed sheets, and workbooks. The use of varied materials contributed to a multi-sensory approach, the method which most tea-

chers agreed produced the best results. Teacher-made materials were also used both to compensate for the lack of age-appropriate materials and to supplement commercial products. The planbooks, by and large, were complete, up to date, and clearly related to the student objectives.

Teacher Training

Interviews revealed that, although 75 percent of the teachers had taught for at least three years, most of their experience was in regular education; more than half had two years or less experience in special education. Moreover, more than 75 percent had two years or less experience in remedial reading. Therefore, the model's teacher-training component was integral to its success. The remedial-reading teachers and educational assistants attended monthly workshops where specific instructional techniques and materials were demonstrated. In addition, teacher trainers visited the classes to perform demonstration lessons and help to overcome specific problems. Nearly all of the model's personnel reported that these training activities were extremely helpful in acquainting them with the methods and materials required to meet the needs of their students and advance the goals of the program. The teachers reported that the demonstration of specific techniques, rather than discussions of general concepts, best prepared them for the task. Many teachers expressed a desire for more training, particularly in the area of oral communication, and more opportunities to discuss problems and ideas with both experts and peers.

Administrative Matters

The articulation between the remediation teacher and the classroom

teacher is vital to the success of pull-out remedial programs. Frequent interactions are necessary to share information concerning pupil progress, coordinate instructional goals and strategies, and establish and maintain rapport.

Although the proposal mandated meetings between regular classroom teachers and program teachers, interviews revealed that, in many cases, problems in communication were encountered. Program teachers often reported the perception of hostility toward them by the regular classroom teachers and the school administration. Some program teachers indicated that school administrators ignored them (even to the extent of not telling them an evaluator was scheduled to visit) or utilized them in ways for which the program was not intended (e.g., covering other classes). On the other hand, many administrators demonstrated their support for the program. In fact, in some schools, program attendance was accorded privileged status. Many of the program teachers expressed a wish for greater involvement with regular classroom teachers and administrators.

A frequent complaint of program teachers concerned what they felt was, an inordinate amount of redundant paperwork; many teachers felt this detracted from their planning and teaching. Specifically, their complaints were focussed upon administrative paperwork rather than that which was directly related to the diagnostic-prescriptive methodology (i.e., pretesting, posttesting, and documenting student progress).

A problem expressed by some teachers was that some classes were too large to individualize lessons: with students at different levels

and with only one teacher and one paraprofessional, it was difficult to provide the individual attention necessary for optimal learning.

Teachers also expressed the need for flexibility in ordering supplies. Nearly all supplies were ordered at the beginning of the year; as the year progressed new needs were perceived, but funds had already been expended.

Parent Involvement

Eleven full-time guidance counselors provided crisis counseling to students and formed and conducted regional parent advisory councils. Representatives of the regional councils comprised the Umbrella's Central Parent Advisory Council. Nevertheless, a majority of program teachers decried the lack of direct parental involvement in the education of their children. As a result, parents were not aware of the goals and methods of the program and, consequently, could not reinforce instruction at home. Although parents were invited to conferences, they rarely attended.

QUANTITATIVE EVALUATION

Data were reported for 15,253 students served at 199 sites throughout the six administrative regions of the Division of Special Education. Eight percent of the population was comprised of truants and low attenders, ten percent were early discharges, and seven percent were late admissions. Accordingly, complete achievement data were reported for 11,433 students (75 percent). The population breakdown by region in order of size was as follows: 3,892 students from the Bronx (25.5 percent of the population of the Prescriptive Reading Model); 2,841 students from

Brooklyn West (18.6 percent); 2,779 students from Brooklyn East (18.2 percent); 2,693 students from Queens (17.7 percent); 2,425 students from Manhattan (15.9 percent); and 603 from Staten Island (4.0 percent).

The students varied widely in age, grade level, and disabling condition. They ranged in age from six to 21, with a mean of approximately 13 years. Approximately 45 percent of the population were served in elementary school buildings; 32 percent were in intermediate and junior high schools; 22 percent in high schools. Although a wide range of disabilities was observed among the target population, almost half (46 percent) were classified as neurologically impaired (NI). Other handicaps, reported in order of frequency were: emotional handicap (EH), 20 percent; educable mental retardation (EMR), 15 percent; neurological impairment in combination with emotional handicap (NIEH), 12 percent; and specific learning disability (SLD), 3 percent. Various other handicaps were reported in frequencies too few to mention.

Variance in the relative incidence of these disabling conditions was observed among the regions. Table 1 presents a breakdown of each regional population by disability. Compared to the total population for the model, the population of the Manhattan Region showed a higher percentage of students classified as SLD and NIEH and a lower percentage of NI and EMR: although students classified as SLD comprised 2.9 percent of the total population of this model, they comprised 7.2 percent of the population of the Manhattan Region (i.e., 4.3 percent more students were classified as SLD in Manhattan.) Similarly, the incidence of students classified as NIEH was four percent greater in Manhattan while the incidence of NI and

TABLE 1

RELATIVE PERCENTAGE OF SPECIFIC DISABLITY GROUPS
WITHIN THE SIX SPECIAL EDUCATION REGIONS

Reegion		Educable Mental Retardation	Specific Learning Disability	Emotional Handicap	Orthopedic Impairment	Neurological Impairment	Neurological Impairment and Emotional Handicap
Manhattan	%	10.9	7.2	18.9	3.3	42.3	16.5
	(N)	(210)	(139)	(364)	(63)	(817)	(318)
Brooklyn West	%	13.3	1.5	24.1	0.7	44.7	14.9
	(N)	(280)	(32)	(506)	(15)	(938)	(312)
Brooklyn East	%	15.0	3.0	21.6	3.5	45.4	10.4
	(N)	(273)	(29)	(394)	(63)	(832)	(189)
Bronx	%	18.9	1.0	13.6	1.8	54.5	8.7
	(N)	(559)	(29)	(402)	(52)	(1613)	(258)
Queens	%	12.5	2.3	16.7	2.2	52.2	13.8
	(N)	(267)	(50)	(357)	(47)	(1119)	(296)
Staten Island	%	9.0	5.9	14.3	1.8	54.2	11.3
	(N)	(35)	(23)	(56)	(7)	(212)	(44)
TOTALS	%	14.3*	2.9	18.3	2.2	48.8	12.5
	(N)	(1624)	(327)	(2079)	(247)	(5531)	(1417)

*Relative percentage of total Prescriptive Reading population.

EMR classifications were 6.5 percent and 3.4 percent lower, respectively. Using the same comparative strategy in analyzing the relative incidence of specific disabilities among the other regions, it can be seen from Table 1 that, relative to the total population for the model: Brooklyn West's target group had 6.2 percent more EH students and 4.1 percent fewer NI pupils; Brooklyn East had 3.3 percent more EH classifications and 3.1 percent fewer NI; the Bronx had 4.6 percent and 3.7 percent more EMR and NI students, respectively, and 4.7 percent and 3.8 percent fewer EH and NIEH, respectively. Staten Island had 3 percent more SLD and 5.4 percent more NI students with 4 percent fewer EH and 5.3 percent fewer EMR; the relative incidence of specific disabilities among the Queens population was proportionate.

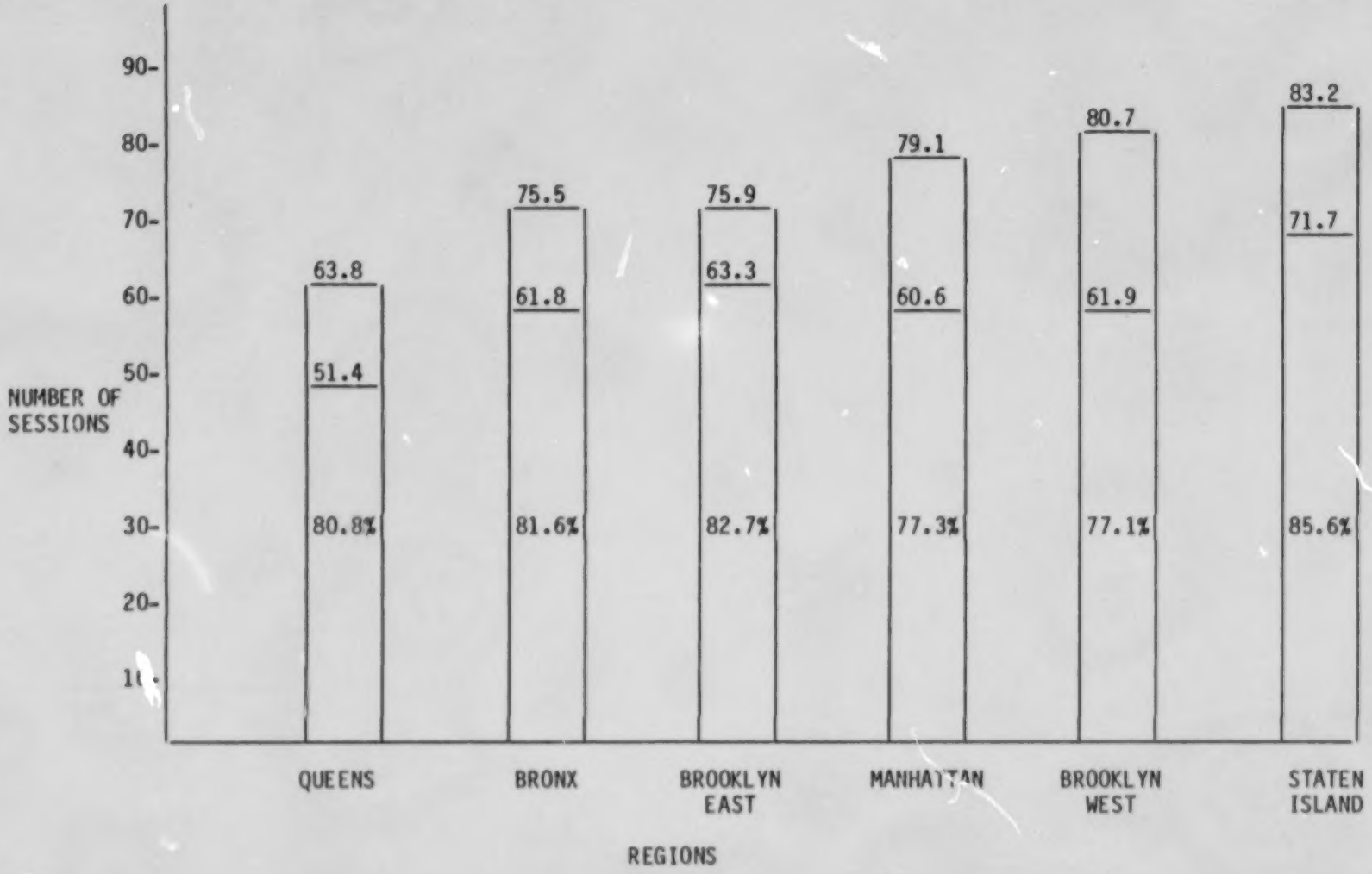
The aforementioned discrepancies may have interpretative significance for the discussion of regional differences in pupil achievement which is presented in the last section of this chapter.

Attendance

Approximately 82 percent of the target population was scheduled to attend three program sessions per week; 13 percent was scheduled for five. The duration of each session was between 40 and 45 minutes. The average number of sessions offered across all sites was 74. The mean percentage attendance for program students was 80 percent, and the average number of sessions attended was 60. Students received an average of 43.1 hours of total instruction.

Variance was noted among the six regions in total sessions offered, percentage attendance, and sessions attended. Figure 1 symbolizes the

Figure 1. Mean total sessions offered, total sessions attended, and percentage attendance for the six special-education regions.



Note. For each region, the top number represents mean sessions offered, the middle number represents mean sessions attended, and the bottom is the mean percentage attendance.

relationships among these variables for the six regions. Mean total sessions offered varied from a high of 83.2 for Staten Island to a low of 63.8 for Queens. Most of the variance was attributable to the opening of new sites (especially in the Queens Region) during the program year made possible by the efficient management, distribution, and expenditure of funds. As indicated in Figure 1, mean percentage attendance varied from highs of 85.6 percent and 82.7 percent in Staten Island and Brooklyn East, respectively, to lows of 77.1 percent and 77.3 percent in Brooklyn West and Manhattan, respectively. The combination of a relatively large mean number of sessions offered and high mean percentage attendance gave Staten Island's students the largest mean number of sessions attended (71.7); Queens' students, at the other end of the distribution, attended an average of 20 fewer sessions (51.4). The relationships between these attendance statistics and the mastery of reading skills are described in the next section on reading achievement. In addition, differences in total sessions attended were controlled in comparing reading achievement among the regions.

Pupil Achievement in Reading

The mastery of reading skills by program students was measured by the ongoing administration of the ICRT, published by the Educational Development Corporation. The objective for the Prescriptive Reading Model proposed that by June 1981, at least 75 percent of the target students would master no fewer than five new reading skills. Figure 2 presents the cumulative frequency distribution of total reading skills mastered by those students for whom complete data were available. The

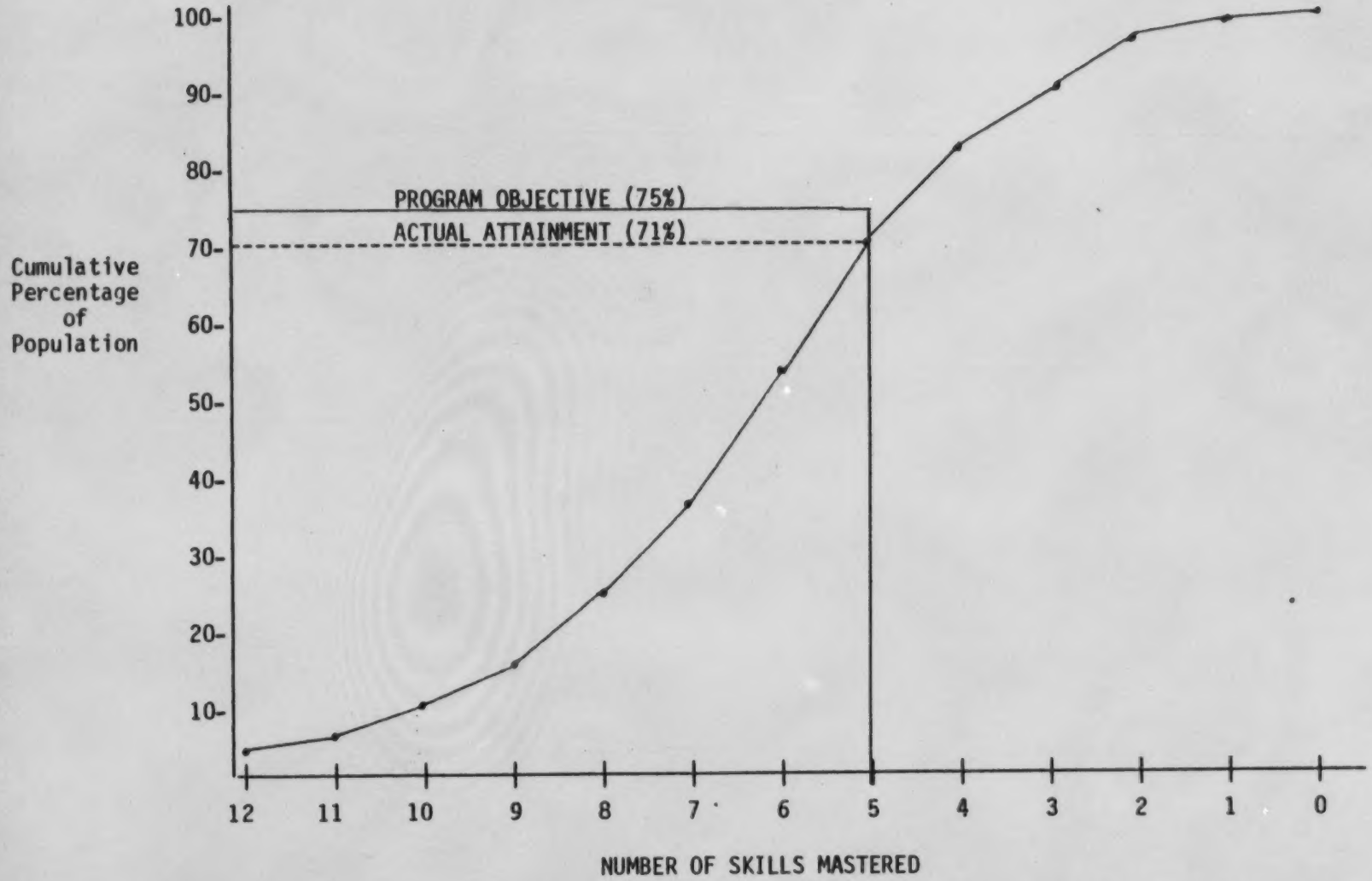


Figure 2. Cumulative frequency distribution of total skills mastered by the Prescriptive Reading Model students (as measured by the ICRT).

function symbolizes the cumulative percentage of students achieving various levels of skills mastery from a maximum of 12 to a minimum of zero new skills. The junction of the solid lines drawn perpendicular to each axis symbolizes the criteron for the objective (i.e., mastery of at least five new skills by 75 percent of the students). Inspection of Figure 2 revealed that although the target students showed impressive growth in reading achievement, the function for total skills mastery fell just short of the criterion; that is, less than 75 percent of the students attained the five-skills-mastered criterion. As can be seen in Table 2, which presents the same data in tabular form, exactly 71 percent of the population attained the five-skill criterion. The mean number of skills mastered was 5.9 and the median, the value that divides the population exactly in half, was 6.2. The mode, the number of skills mastered by the largest number of students, was five. Importantly, only two percent of the population failed to show any measurable growth. Accordingly, although the criterion was not attained, notable and meaningful gains in reading skills were achieved by most of the students.

In drawing conclusions from these findings, it must be cautioned that these data were gathered during May, 1981, one month prior to the proposed date for attainment of the objective (i.e., June, 1981). It is estimated that, if the students maintained their observed rate of mastery, actual achievement would have surpassed the proposed criterion.

To determine the kinds of reading skills mastered by program students the data were analyzed by component skills; Table 3 presents summary statistics from this analysis. As indicated in Table 3, pupil

TABLE 2

FREQUENCY DISTRIBUTION OF TOTAL READING SKILLS MASTERED BY STUDENTS IN THE PRESCRIPTIVE READING MODEL (AS MEASURED BY THE ICRT)

Number of Skills Mastered	Number of Students	Relative Percent of Population	Cumulative Percent of Population
12	436	3.8	3.8
11	299	2.6	6.4
10	515	4.5	10.9
9	793	7.0	17.9
8	993	8.7	26.6
7	1292	11.3	37.9
6	1793	15.7	53.6
5	1975	17.4	71.0
4	1221	10.8	81.8
3	1002	8.8	90.6
2	582	5.1	95.7
1	263	2.3	98.0
0	233	2.0	100.0
	11397		

NOTE: The dashed line in this and subsequent tables represents the program criterion.

TABLE 3

SUMMARY OF STUDENT ACHIEVMENT BY
READING COMPONENT
(N = 11,397)

Component	Percentage of Population Showing Mastery	Range of Mastery	Mean Number Mastered
Comprehension	76.6	0-12	2.6
Phonics	72.4	0-9	2.6
Word Analysis	68.8	0-7	1.8
Vocabulary	40.9	0-5	1.6
Study Skills	1.0	0-3	1.2

growth was observed in five components listed according to relative frequency of mastery: comprehension, phonics, word (structural) analysis, vocabulary, and study skills. Approximately three quarters of the students for whom these data were available (N = 11,397) mastered skills in both comprehension and vocabulary. The average number of specific skills mastered in each of these two components by these students was 2.6: that is, the 76.6 percent of the population that showed mastery in comprehension mastered an average of 2.6 new comprehension skills; the 72.4 percent that showed mastery in phonics mastered 2.6 new phonics skills. Almost 69 percent of the students mastered skills in word analysis; the mean number mastered for this group was 1.8. Only one percent of the subjects showed mastery of study skills.

To determine the percentage of mastery of the short-term reading skills proposed in each student's IEP, comparisons were made between the numbers of these objectives (skills) mastered, not mastered, and not attempted. The mean percentage of mastery for the total population was 77 percent; that is, the average student mastered 77 percent of the short-term reading objectives proposed in his/her IEP. An average of approximately 14 percent of the skills proposed and attempted were not mastered; approximately nine percent of the proposed objectives for each student were not attempted. Mean mastery rate (i.e., the average number of sessions required for a student to master one new skill) was 11.5 sessions (approximately four weeks of instruction).

To ascertain the separate effects of school level (i.e., elementary,

intermediate, junior high, and senior high), attendance, and age upon the mastery of reading skills, Pearson product-moment correlation coefficients were computed between these descriptive variables, on the one hand, and the total number of new reading skills mastered (total mastery), percentage of mastery, and mastery rate, on the other. These correlations and the percentages of variance in each measure of mastery accounted for individually by each descriptive variable (r^2) are presented in Table 4. The percentage of variance in each of the achievement measures accounted for by the students' age and school level was negligible. Indeed, age accounted for none of the variance in total mastery and mastery rate, and only three percent of the variance in the percentage of mastery; school level was observed to have no correlation at all with these three achievement measures.

A substantial correlation (r = .58) was observed between total mastery and the total number of sessions attended; the latter accounted for 37 percent of the variance in the former. The relationship between total sessions attended and percentage of mastery (r = .41), although substantial, was not as strong as that observed for total mastery; 17 percent of the variance for these two variables was shared. Only three percent of the variance in mastery rate was attributable to total sessions attended: interestingly, the relationship was inverse (i.e., mastery rate tended to decrease as the total sessions attended increased).

The relationships between the three achievement measures and percentage attendance, although less substantial, closely paralleled those observed for total sessions attended.

TABLE 4

MATRIX OF CORRELATIONS (r) AND PERCENTAGES OF SHARED VARIANCE (r^2) BETWEEN DESCRIPTIVE VARIABLES AND READING ACHIEVEMENT MEASURES

Reading Achievement Measures		Descriptive Variables: School Level	Sessions Attended	Percentage Attendance	Age
Number of Skills Mastered	r	.00	.58	.37	-.04
	r^2	0	37	14	0
Percentage of Mastery	r	.00	.41	.36	-.18
	r^2	0	17	13	3
Mastery Rate	r	.00	-.18	-.06	-.02
	r^2	0	3	4	0

NOTE: Since these values represent population parameters rather than sample statistics, significance levels were not computed.

TABLE 5

BREAKDOWN OF FOUR MEASURES OF READING ACHIEVEMENT BY REGION

Reading Achievement Measures	REGIONS						
	Manhattan	Brooklyn West	Brooklyn East	Bronx	Queens	Staten Island	Total Population
Percent Attaining Five-Skill Criterion	77.5	61.5	75.4	65.2	76.8	82.8	71.0
Mean Number of Skills Mastered	6.3 (6.3)	5.4 (5.3)	6.3 (6.1)	5.6 (5.6)	6.3 (6.7)	7.3 (6.8)	6.0
Mean Percentage of Mastery	81.9 (81.8)	72.7 (72.3)	79.7 (79.0)	78.4 (78.0)	74.5 (76.7)	80.5 (77.8)	77.5
Mean Mastery Rate	10.9 (10.9)	12.5 (12.3)	11.4 (11.1)	13.3 (13.1)	8.9 (9.8)	10.6 (9.4)	11.5

Note. Parenthesized means have been adjusted for regional differences in total number of sessions attended.

Differences in Achievement Among the Regions

Since qualitative program assessment indicated that some methodological variations existed among the regions in the implementation of the Prescriptive Reading Model, regional differenes in reading achievement were examined. Table 5 presents a breakdown of four measures of reading achievement by region: percentage of students attaining the proposed five-skill criterion; mean number of skills mastered; mean percentage of mastery; and the mean rate of mastery. To control for regional variations in average number of sessions attended, the means for the latter three achievement measures were adjusted through covariation; both unadjusted and adjusted means are presented in the table. Inspection of Table 5 indicate that notable variation in these measures of achievement occurred among the regions. The model's objective (i.e., the mastery of at least five new skills by at least 75 percent of the population) was attained in four of the six regions: Manhattan, with 77.5 percent of the students attaining the criterion; Brooklyn East, 75.4 percent; Queens, 76.8 percent; and Staten Island, 82.8 percent. The unadjusted mean number of skills mastered varied from a high of 7.3 for Staten Island to a low of 5.4 for Brooklyn West; Manhattan, Brooklyn East, and Queens had means of 6.3, while the Bronx had a mean of 5.6. However, adjusting the means for regional differences in sessions attended reduced the range of mean regional mastery from between 5.4 and 7.3 skills (a mean difference of 1.9 skills) to between 5.3 and 6.8 skills (a mean difference of 1.5 skills). Accordingly, it appears that at least some of the regional variation in total skills mastery attributable to differences in average sessions attended. Specifically, as previously

indicated in Table 2, Staten Island had the highest mean sessions attended, indicating that the students in this region benefited from more instructional time than those in the other regions. Hence, the adjusted mean total skills mastery for Staten Island is .5 skills less than the unadjusted mean total mastery that was .4 skills higher than the unadjusted value; the adjusted mean was 6.7 while the unadjusted mean was 6.3. Thus, when sessions attended were controlled, mean mastery for Staten Island and Queens were virtually equal and both were superior to the adjusted mean mastery observed for the other four regions.

The mean percentage of mastery varied from a high of 81.9 percent in Manhattan to a low of 72.7 percent in Brooklyn West. The only means that were affected to a large degree by adjustments for differences in sessions attended were those for Queens and Staten Island; the former increased by 2.2 percentage points to 76.7 percent; the latter decreased by 2.7 points to 77.8 percent. The rank order, from high to low for adjusted mean percentage of mastery was as follows: Manhattan (81.8 percent); Brooklyn East (79.0 percent); Bronx (78.0 percent); Staten Island (77.8 percent); Queens (76.7 percent); and Brooklyn West (72.3 percent).

Mastery rate varied from 8.9 sessions per skill for the Queens Region to 13.3 sessions for the Bronx. Adjustments for differences in sessions attended lowered the mastery rate for Queens (i.e., increased the mean) by almost one session and increased the rate (i.e., decreased the mean) for Staten Island by 1.2 sessions to 9.4--the lowest (i.e., best) adjusted rate among the six regions. The rank order, from high to low, of adjusted

TABLE 6

BREAKDOWN OF FOUR MEASURES OF READING ACHIEVEMENT
BY THE FOUR PRINCIPAL DISABILITY GROUPS

Reading Achievement Measures	Disability Groups			
	EMR	EH	NI	NIEH
Percentage attaining Five-Skill criterion	66.0	67.5	75.1	69.2
Mean Number of Skills Mastered	5.7 (5.5)	5.6 (5.8)	6.2 (6.1)	6.2 (6.3)
Mean Percentage of Mastery	73.7 (72.8)	75.3 (76.6)	79.8 (79.4)	75.6 (76.4)
Mean Rate of Mastery	13.3 (12.8)	10.9 (11.4)	11.4 (11.2)	10.3 (10.7)

Note. Parenthesized means were adjusted for differences in mean number of sessions attended among disability groups.

mean mastery rates was as follows: Staten Island (9.4 sessions per skill mastered); Queens (9.8); Manhattan (10.9); Brooklyn East (11.1); Brooklyn West (12.3); and the Bronx (13.1).

Differences in Achievement Among Disability Groups

Although the program served students with numerous disabilities, most of the population was classified in four principal disability groups; NI (N = 5504); EH (N = 2069); EMR (N = 1618); and NIEH (N = 1408). Table 6 presents the breakdown of the four achievement metrics described in the section above by these four disability groups.

As observed in Table 6 only one disability group met the five-skill criterion: 75.1 percent of the NI students (the group which comprised 46 percent of the total population) attained the objective. The corresponding percentages for the NIEH, EH, and EMR students were 69.2 percent, 67.5 percent, and 66.0 percent, respectively. The NIEH and NI students showed the highest adjusted mean number of skills mastered: 6.3 and 6.1, respectively. The adjusted means for EH and EMR students were 5.8 and 5.5, respectively.

Adjusted mean percentage of mastery varied from a high of 79.4 percent for the NI students to a low of 72.8 percent for the EMRs. Adjusted mean mastery rate varied from a high of 10.7 sessions to master one new skill for the NIEH students to a low of 12.8 sessions per skill for the EMR students. Thus, for all four achievment measures, the NI, NIEH, and EH groups showed higher performance levels than the EMR group. For all measures, except mastery rate, the NI students performed better than the other three disability groups.

Discussion of the Findings

The analysis of the quantitative data gathered in the evaluation of the Prescriptive Reading Model indicates that, overall, the model successfully assisted Title I-eligible handicapped students to master specific reading skills. Although, at the time of data collection, pupil achievement fell just short of the proposed criterion, it is projected that, had data been collected at the end of the program year, the objective would have been attained. The reading components in which most skills mastery occurred were comprehension, word analysis, and phonics.

Analysis of the effects of age, school level, attendance, disability, and region upon skills mastery revealed the following:

-- age and school level had virtually no relationship with either total mastery, percentage of mastery, or mastery rate;

-- there was a strong direct relationship between total sessions attended and total mastery and percentage of mastery; the relationship between sessions attended and mastery rate was weak and inverse;

-- the NI students scored higher on all measures of achievement than the EH and EMR students: the NI group was the only disability group to attain the criterion;

-- four of the six special-education regions attained the program objective. After adjusting for differences in sessions attended, Staten Island and Queens showed the highest mean mastery and fastest mean rate of mastery; Manhattan had the highest mean percentage of mastery.

Given the observed variations among the regions in mean attendance and the incidence of specific disabilities, variables observed to affect mastery, the magnitude of regional differences, after partialing out the

effects of sessions attended and incidence of disability, was examined through hierarchical multiple-regression analysis. The percentages of variance in three achievement measures--total mastery, percentage of mastery, and rate of mastery--successively accounted for by each of the three descriptive variables are presented in Table 7. The order of entry of the descriptive variables--which was selected to isolate the variance accounted for by region controlling for the effects of sessions attended and disability--corresponded to the order of their presentation in the table. Almost one-third (32.4 percent) of the variance in total mastery was accounted for by the total number of sessions attended by the students. Adding disability into the analysis increased the percentage of explained variance in total mastery by only 0.7 percent. Only 2.4 percent of the remaining variance in total mastery (after the entry of sessions attended and disability) was accounted for by region. Hence, very little of the variance in total mastery was related to either region or disability after controlling for the influence of sessions attended. Thus, although differences in total mastery were observed among the regions and disability groups, these differences did not contribute substantially to an explanation of the influences upon reading mastery. Moreover, 63.9 percent of the variance in mastery was not explained by any of the measured descriptive variables; the unexplained variance in percentage of mastery and mastery rate was even higher. It may be hypothesized with some assurance that some of this residual (unexplained) variance was related to methods and materials, local school and district factors, non-Title I instructional programs, and measurement error. It is recommended that the designs of future evaluations attempt to directly determine the relative influence of these and other factors.

TABLE 7

PERCENTAGE OF VARIANCE IN TOTAL MASTERY, PERCENT OF MASTERY, AND RATE OF MASTERY ACCOUNTED FOR BY SESSIONS ATTENDED, DISABILITY, AND REGION

Source of Variance	Achievement Measure		
	Total Mastery	Percentage of Mastery	Rate of Mastery
Sessions Attended	32.4	16.3	18.2
Disability	0.7	1.1	0.6
Region	2.4	1.4	1.3
Interaction (Disability x Region)	0.6	0.4	0.4
Residual	63.9	80.0	79.5

NOTE. Percentages of variance were determined by the change in r^2 resulting from the entry of each descriptor in a hierarchical multiple-regression analysis. The order of entry of the descriptors corresponds to their order of presentation.

- Sessions attended accounted for 32.4 percent of the variance in total mastery, and 16.3 percent and 18.2 percent of the variance in percent of mastery and rate of mastery, respectively.
- After partialing out the influences of sessions attended and disability, region accounted for 2.4 percent of the variance in total mastery.
- The percentages of unexplained variance were 63.9 percent, 80 percent, and 79.5 percent for total mastery, percentage of mastery, and rate of mastery, respectively.

III. LEARNING TO READ THROUGH THE ARTS

DESCRIPTION

This was an integrated model consisting of a diagnostic-prescriptive reading component and a reading-oriented arts component. It was designed to promote the mastery of reading skills through the medium of the creative arts. The citywide Learning to Read Through the Arts (LTRTA) program, organized in 1971, first served special-education students during the 1979-80 school year. At that time, approximately 200 handicapped children attended the program. During the 1980-81 school year, the special-education model of LTRTA was expanded to serve approximately 1,000 disabled students at four integrated school sites. One site was located in each of the following special-education regions: Brooklyn East, Brooklyn West, Manhattan, and the Bronx. In the two regions which did not have sites, 50 special-education students were indirectly served through a component of the mainstream citywide Title I Umbrella.

This model was under the supervision of the project director of the citywide LTRTA program and the Division of Curriculum and Instruction. Students from schools throughout the areas served by each site were bused to the sites with their classroom teachers two half-days a week. They participated in both components (i.e., the diagnostic-prescriptive reading and a reading-oriented arts workshop) each time they attended. In addition, they attended field trips to museums and cultural institutions.

The arts workshops were designed to promote reading and abstract verbal skills through concrete, experiential learning. There were reading-oriented workshops in painting, drawing, sculpture, photography, crafts, music, and

dance. The field trips and special events also centered around the cultural arts. These included visits to the New York Aquarium, the Brooklyn Museum, the Queens Museum, the Ballet Hispanica of New York, the Staten Island Children's Museum, and the Bronx Museum of Art. Also there were an annual Performing Arts and Film Festival and a Learning to Read Through the Arts Exhibition where the work of participating students was displayed.

Teacher-trainers and assistant coordinators provided pre-service and in-service training for program staff and the participating teachers of special education classes. Each special education site had an assistant coordinator, a workshop liaison, two or three reading teachers, and four artist-teachers. Groups of approximately 50 children were served at each site at one time, with attendance averaging 10 to 12 children in arts workshops, and five to eight in reading workshops. In addition, each site had four paraprofessionals who generally helped in the arts workshops, but were on call to aid the reading teacher.

Since each site served children four days a week, only the assistant coordinator and the workshop liaison were full-time employees. The remainder of the staff was paid on a per-diem basis.

QUALITATIVE EVALUATION

Physical Setting, Equipment, and Supplies

The physical plants for this program, although old school buildings, were well-equipped and well-supplied. Bulletin boards with vocabulary words, appropriate decorations, and/or material relating to the arts workshops were evident. Students' work was displayed and student work areas were well-defined.

The workshops were decorated with words relating to the particular arts experiences provided in them.

Instructional Activities and Characteristics

The field consultants reported that a wide variety of activities were being conducted at the sites. Students were variously involved in photography, movement workshops, printmaking, mixed media, sculpture, puppetry, and other arts activities. These workshops incorporated vocabulary, sequencing, and comprehension skills into the artistic lessons. Students kept journals describing their artistic experiences.

Instruction in the reading workshops was provided either in small groups or individually. Materials used were both teacher-made and commercially-made. The lessons which were geared to the objectives delineated in the students' IEPs used a variety of approaches, such as oral reading and flashcards.

The students' classroom teachers participated in both the arts workshops and the reading workshops. These teachers noted that they utilized the lessons from the arts and reading workshops in their planning for the rest of the week.

Teachers (arts workshops, reading, and regular classroom) indicated that the evaluative instrument, the Wisconsin Design Skills Development Test (WDSDT), was appropriate for measuring growth in reading. However, they further indicated that additional measures were needed to reflect changes in self-image and maturity, variables, which, in their opinion, were also affected by the program.

QUANTITATIVE EVALUATION

Data were submitted for a total of 995 children served in four regions:

256 children (25.7 percent) were served in Manhattan, 246 (24.7 percent) children were served in Brooklyn West, 243 (24.4 percent) in Brooklyn East, and 250 (25.1 percent) in the Bronx.

Of the total of 995 students, 22 (2.2 percent) were truant or low attenders, 124 (12.5 percent) were discharged, and 45 (4.5 percent) were late admissions. Therefore, complete achievement data were reported for 804 students (80.8 percent).

All children attending this program were at the elementary school level. The age range was seven to 20 years, with a mean of 10.6 years, and a mode of 11 years.

The specific disabilities represented in the population, in rank order, according to number, were as follows: NI, 42.3 percent; EH, 21.5 percent; SLD, 13.7 percent; EMR, 12.3 percent; and NIEH, 9.6 percent.

Attendance

Children attended the program twice a week for two hours per session. The number of sessions attended ranged from zero to 57. The mean number of sessions attended was 34.4; the median was 36.8 (approximately 18 weeks of instruction), and the mode was 49 sessions. The mean number of total instructional hours was 68.8. Excluding truants, late admissions, and discharges, the mean percentage attendance was 79.1 percent.

Achievement Data

The objective of this program was that 60 percent of the population would master at least four new skills in reading as measured by the WDSDT. This goal was surpassed: 71.9 percent of the population achieved the criterion

(i.e., mastered at least four new skills). (See Figure 3.) As observed in Table 8, which shows the frequency distribution of total reading skills mastered for the LTRTA population, the range of mastery (zero to seven skills) was, relative to the other models, narrow: over one half of the students (56.1 percent) mastered exactly five new skills. Importantly, only eleven students (1.4 percent) showed no growth.

The mean percentage of mastery of the short-term goals listed in each student's IEP was 90.9 percent; the mean percentage of short-term goals attempted and failed was 4.9 percent; 4.2 percent were not attempted.

To determine the types of reading skills mastered, the percentage of students mastering skills in each of five reading components was calculated. The principal focus of the program was upon the mastery of comprehension skills: 92.8 percent of the students showed mastery in this area. The second priority area was phonics: 66 percent of the students mastered phonics skills. Almost 24 percent of the subjects mastered vocabulary skills.

Effects of Attendance, Age, and Disability Upon Reading Achievement

To determine the relationship between program attendance and student age, on the one hand, and reading achievement as measured by the number of skills mastered, the rate of mastery, and the percentage of mastery, on the other, Pearson product-moment correlation coefficients were computed. The correlation coefficient between total sessions attended and the number of skills mastered was highly significant ($r = .52$, $n = 804$, $p<.001$). Sessions attended accounted for 27 percent of the variance in skills mastery, thereby indicating that program attendance had both a significant and meaningful effect upon reading accomplishment.

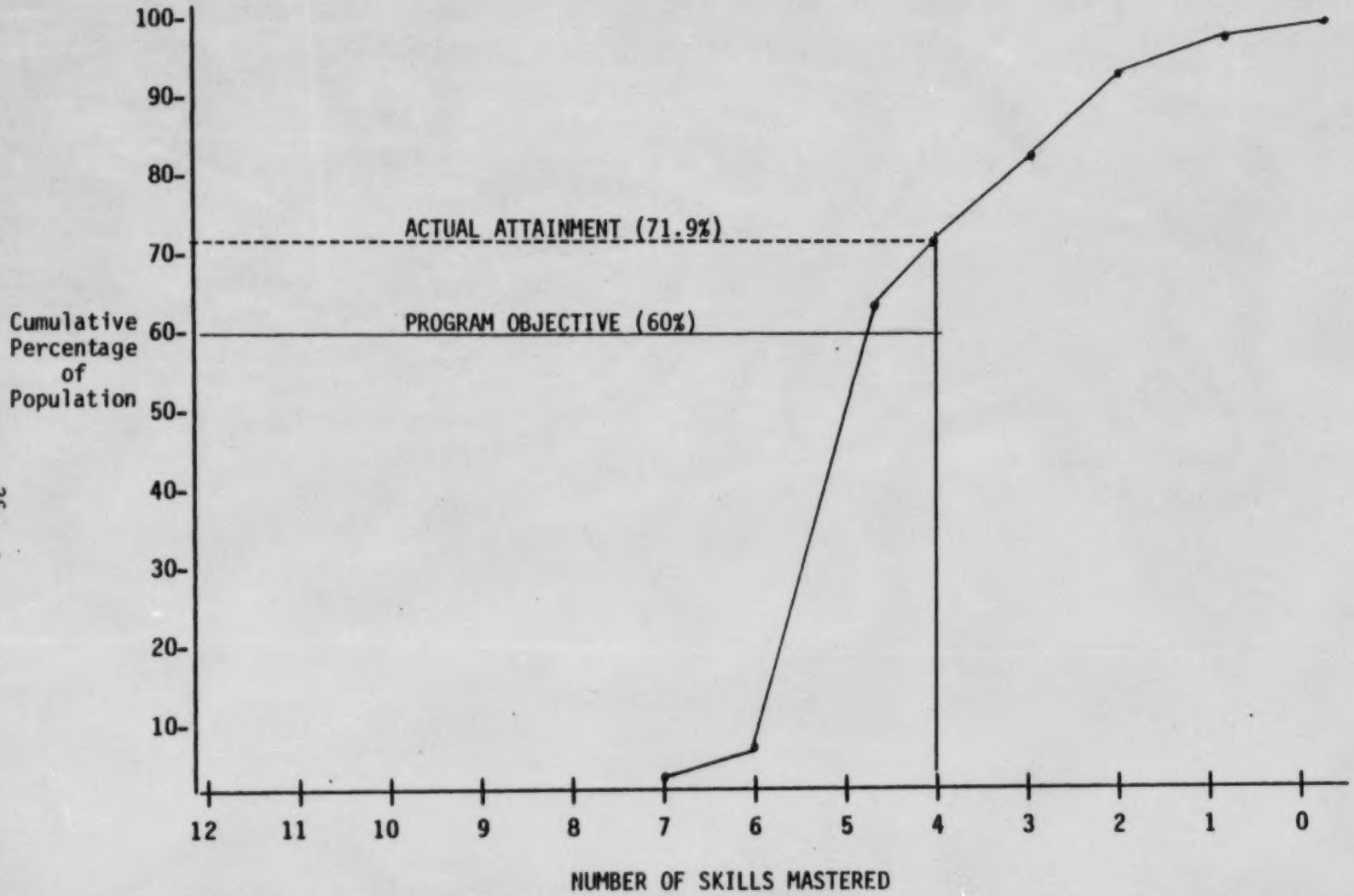


Figure 3. Cumulative frequency distribution of total skills mastered by the Learning to Read Through the Arts Model students (as measured by the WDSDT).

TABLE 8

FREQUENCY DISTRIBUTION OF THE NUMBER OF TOTAL READING SKILLS MASTERED BY STUDENTS IN THE LTRTA MODEL (AS MEASURED BY THE WDSDT)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
7	3	0.4	0.4
6	53	6.6	7.0
5	451	56.1	63.1
4	71	8.8	71.9
3	73	9.1	81.0
2	38	10.9	91.9
1	54	6.7	98.6
0	11	1.4	100.0
	804		

Mastery rate showed a highly significant correlation with sessions attended (r = .44, n = 993, p<.001). That is, those students who attended more sessions required, on average, more instructional time to master one new reading skill. Thus, mastery rate tended to increase (i.e., decline) with increases in sessions attended. This relationship is graphically illustrated in Figure 4. As observed in this figure, the number of sessions required for the mastery of one new skill rose from a low of 3.2 for those students who attended ten sessions or fewer to a high of 12.4 for those who attended 51-60 sessions (the maximum interval.) The largest mean increase was observed at the low end of the continuum of sessions attended: the 11-20 session group had a mean of 8.8 sessions to master one skill, five sessions more then the mean for the ten-or-fewer sessions group. Although mastery rate continued to decline across the entire continuum of sessions attended, the rate of decline was less severe at the upper end of this continuum. The correlation between sessions attended and the percentage of mastery was also significant (r = .38, n = 993, p<.001). Over fourteen percent of the variance in percentage of mastery was accounted for by sessions attended.

The correlations between age and the three measures of achievement were all low and not statistically significant: the correlation coefficients were -.04, -.02, and .05 between age and total mastery, percentage of mastery, and rate of mastery, respectively.

To determine the effect of specific disability upon the three measures of reading achievement, analyses of covariance were applied to the achievement data by disability, controlling for differences in total sessions

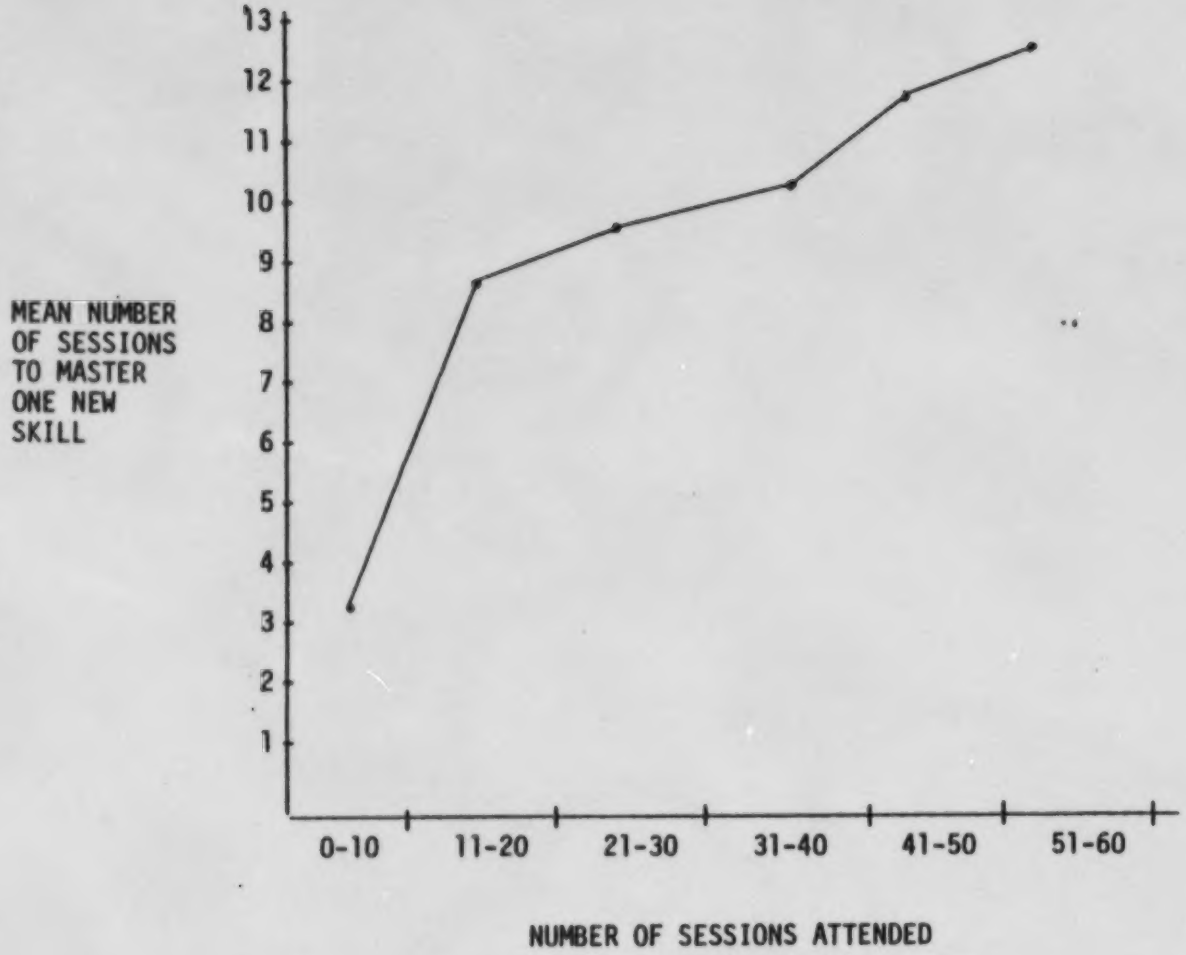


Figure 4. Plot of mean number of sessions required to master one new skill by total sessions attended for the LTRTA students.

attended. Statistically significant differences were observed among the disability groups for all three dependent variables. To ascertain which disability groups differed significantly from each other for each dependent measure, post-hoc comparisons among the adjusted means for all pairs of for each measure, were performed using the Newman-Keuls procedure (see Tables 9, 10, and 11). As observed in Table 9, the EMR students scored significantly lower in mean skills mastered than either the EH, NI, or NIEH students; the largest mean difference, 0.89 skills, was observed between the NIEH (4.52 skills) and EMR (3.63) groups. As observed in Table 10, the NIEH group showed a significantly smaller mean number of sessions to master one skill (i.e., faster learning rate) than either the EH or EMR groups; the largest mean difference, 3.28 sessions, was observed between the NIEH (9.18 sessions) and the EMR (12.46) groups. As indicated in Table 11, the EMR groups showed a significantly lower mean percentage of mastery than either the SLD, NIEH, Deaf, or EH groups.

TABLE 9

COMPARISON OF MEAN NUMBER OF SKILLS MASTERED
AMONG ALL PAIRS OF DISABILITY GROUPS
(NEWMAN-KEULS PROCEDURE)

		EMR	SLD	EH	NI	NIEH
	MEAN	3.63	4.04	4.05	4.27	4.52
EMR	3.63	-	0.41	0.42*	0.64**	0.89**
SLD	4.04		-	0.01	0.23	0.48
EH	4.05			-	0.22	0.47
NI	4.27				-	0.25
NIEH	4.25					-

* $p < .05$
** $p < .01$

NOTE. Means have been adjusted for differences in sessions attended.

- The adjusted mean number of skills mastered by EMR students was significantly lower than those for the NIEH, NI, and EH groups.
- No other differences were statistically significant.

TABLE 10

COMPARISONS OF MEAN LEARNING RATE AMONG
ALL PAIRS OF DISABILITY GROUPS
(NEWMAN-KEULS PROCEDURE)

		NIEH	NI	SLD	EH	EMR
	MEAN	9.18	10.56	11.21	11.67	12.46
NIEH	9.18	-	1.38	2.03	2.49*	3.28**
NI	10.56		-	0.65	1.11	1.9
SLD	11.21			-	0.46	1.25
EH	11.67				-	0.79
EMR	4.52					-

* $p < .05$
** $p < .01$

NOTE. Means have been adjusted for differences in sessions attended

- The NIEH students mastered skills at a significantly faster rate than either the EMR or EH students.
- None of the other differences were statistically significant.

TABLE 11

COMPARISONS OF MEAN PERCENTAGE OF SKILLS MASTERED AMONG ALL PAIRS OF DISABILITY GROUPS

		EMR	SLD	NIEH	DEAF	EH
	MEAN	.83	.90	.92	.93	.94
EMR	.83	-	.07**	.09**	.10**	.11**
SLD	.90		-	.02	.03	.04
NIEH	.92			-	.01	.02
DEAF	.93				-	.01
EH	.94					-

** $p < .01$

NOTE. Means have been adjusted for differences in sessions attended.

- The adjusted mean percentage of skills mastered by the EMR group was signficantly lower than those observed for the other four disability groups.
- No statistically significant differences were observed among any of the other group means.

IV. BRIDGE TO SCHOOL

DESCRIPTION

This model, which served integrated public schools, provided supplementary remedial instruction to approximately 600 eligible handicapped children between the ages of 4.9 years and 7.0 years who were enrolled in early-childhood special education classes. Whereas the other models under the Umbrella were designed to promote the mastery of actual reading skills, this model was distinguished by its focus upon the development of cognitive and reading-readiness skills.

The children were taught in small instructional groups, each composed of between two and five students. Since this was a readiness program for children who had demonstrated difficulties in cognitive development, social-emotional skills, and perceptual-motor development, the pupil-teacher ratio was low. The goal of this model was to prepare the target students for actual reading instruction.

QUALITATIVE EVALUATION

Physical Setting, Equipment, and Supplies

Sites for this model included regular classrooms, offices, resource rooms, and, in a few cases, storage rooms, auditoriums, and an assortment of specialty rooms which had been converted for program use.

Some of these facilities were not conducive to effective instruction and placed hardships on both teachers and students. The auditoriums, for example, had absolutely no room for program equipment except that which

was currently in use. Equipment, materials, folders, and student work had to be transported to the auditorium from storage for each session--a burdensome procedure which also consumed instructional time. The storage rooms, in which pupils were served at several sites, although dimly lit and drab, were arranged and decorated, to the credit of the teachers, as attractively as possible.

Supplies were delivered on time and were appropriate to the population served and the subject matters taught. Most sites had secure storage space for hardware and supplies.

Instructional Activities and Characteristics

Most of the instructional activities were conducted on an individual basis, with a few students taught in small groups. There were no para-professionals in this model.

Instructional activities observed included reading from books, working on word recognition and pronunciation, and word games. Records were up-to-date. Folders contained samples of students' work, IEPs, and baseline and ongoing criterion-referenced tests.

As in all of the models, nearly all remediation teachers had participated in formulating the IEPs with the regular classroom teachers; those teachers who had not were new to the program. Planbooks were consistant with the program objectives and materials were suitably used.

Teacher Experience

Almost half of the teachers in this model had two years or less of total teaching experience; although all had special education training, over half had two years or less of special education experience. More-

over, the majority of teachers had two years or less experience in compensatory education.

QUANTITATIVE EVALUATION

Data were reported for a total of 608 students. Of this total, nine (1.5 percent) were truants or low attenders, 49 (8.1 percent) were discharged, and 32 (5.3 percent) were late admissions. Therefore, complete achievement data were reported for 518 student (85.2 percent).

All of the students were served in elementary schools. The children ranged in age from five to 12, with a mean age of 7.2 years; the mode was 7.0 years. Ninety percent were classified as SLD.

Attendance

All of the students attended the program three sessions per week; each session lasted 30 minutes. The number of sessions attended varied from three to 89 with a mean of 51.7, a median of 54.6, and a mode of 57.0. The percentage of attendance for the total group was 86.7 percent.

Achievement

The objective of this program was that 75 percent of the students would master five reading objectives which they had not previously mastered, as measured by the Criterion Reading Test (CRT) published by Random House.

As observed in Figure 5, the cumulative frequency distribution of total skills mastered, the program objective was easily surpassed: 91.5 percent of the students mastered at least five new skills. As indicated by Table 12, more than half of the population (52 percent) mastered nine or more skills; 14.5 percent mastered exactly twelve.

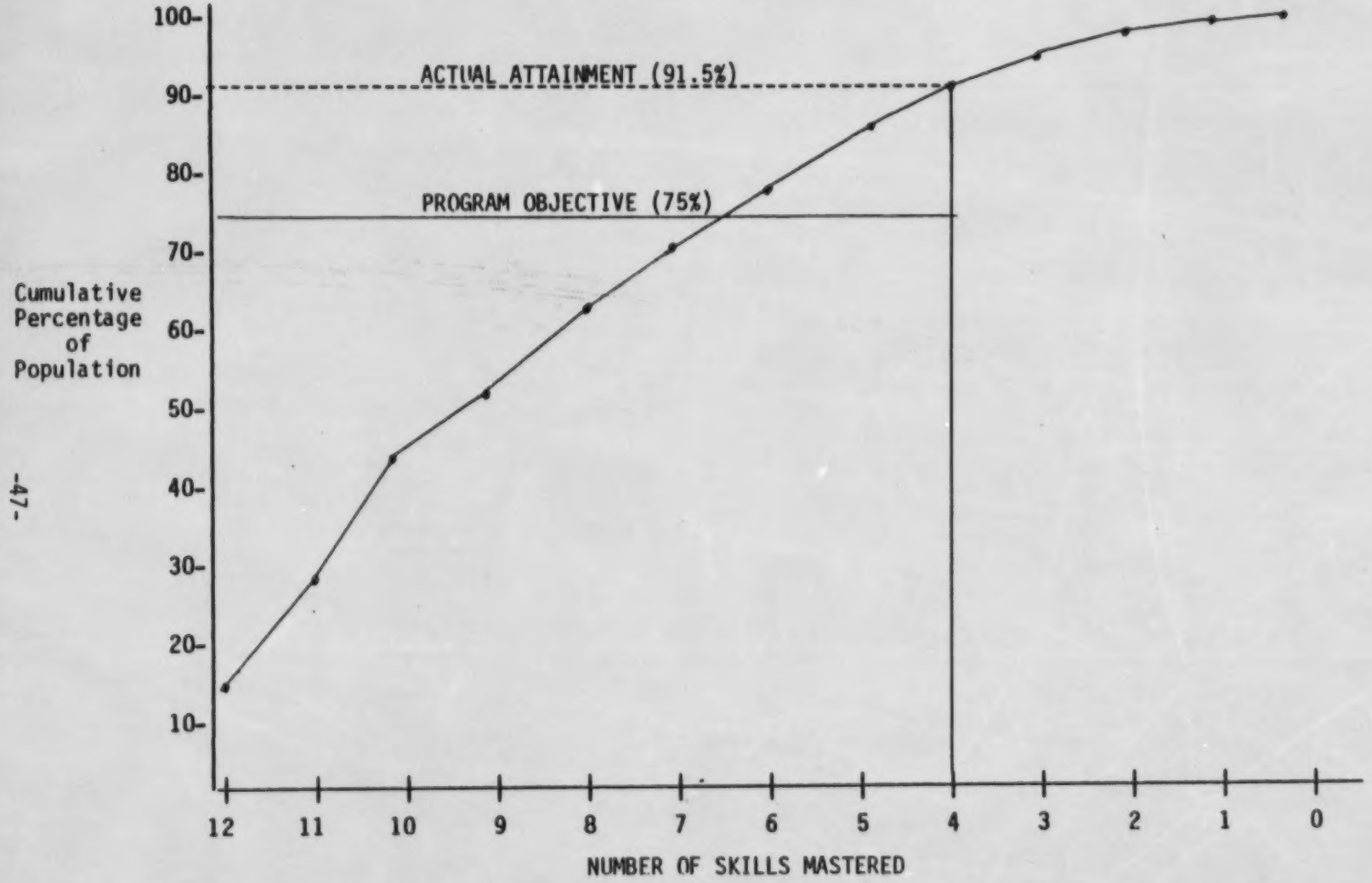


Figure 5. Cumulative frequency distribution of total reading skills mastered by students in the Bridge to School Model (as measured by the CRT).

TABLE 12

FREQUENCY DISTRIBUTION OF THE NUMBER OF READING SKILLS MASTERED BY STUDENTS IN THE BRIDGE TO SCHOOL (AS MEASURED BY THE CRT)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
12	75	14.5	14.5
11	78	15.1	29.6
10	74	14.3	43.9
9	42	8.1	52.0
8	56	10.8	62.8
7	39	7.5	70.3
6	46	8.9	79.2
5	36	6.9	86.1
4	28	5.4	91.5
3	17	3.3	94.8
2	18	3.5	98.3
1	8	1.5	99.8
0	1	0.2	100.0
	518		

Consistent with the goal of this model (i.e., to prepare early childhood students with the skills that will enable them to learn to read), nearly all of the skills mastered were in the categories of coping skills and general cognitive readiness (87.7 percent of all skills mastered). The other categories of mastery were phonetic analysis, structural analysis, vocabulary, and comprehension.

V. ORAL APPROACH TO READING

DESCRIPTION

The Oral Approach to Reading Model was designed to improve the reading skills of approximately 660 eligible handicapped children in grades 2 to 6. To remediate their reading deficits, the target pupils received one-to-one instruction in small-groups each averaging three to five pupils. Each teacher-paraprofessional team served approximately 30 different pupils a week. This model was implemented in integrated schools which had between 30 and 45 eligible handicapped children, or in schools that had been served by the model last year. This model employed an oral-communication approach to remedial reading and used, principally, the curriculum and learning materials of the Monterey Reading and Language Programs. In coordination with the Citywide Office of Speech Services, sites were selected so that the six special-education regions would be proportionately represented in the total population of the model; it was deployed in 23 schools. Teacher trainers provided monthly workshops for the in-service training of program staff.

QUALITATIVE EVALUATION

Physical Setting, Equipment, and Supplies

Over half of the classes in this model were held in regular classrooms; the rest were held in resource rooms and various miscellaneous facilities. Observations revealed that, for the most part, these sites conformed to program requirements and specifications. However, in those places which were not designed for classroom instruction, problems with space or usage were re-

ported. For instance, one class was held in a sewing room which had equipment and decorations appropriate for that setting, but could not be decorated as a reading room.

All sites were well-equipped with hardware. Although most supplies were received on time, the school-store supplies, which were used as rewards to motivate and reinforce pupil achievement, were not delivered as promptly as the instructional supplies; many teachers supplied these stores through their own funds. Moreover, some teachers indicated that the prizes which they did receive were often inappropriate to the age level of the students.

Except in those sites where decorating was difficult, rooms were well-decorated and student work areas were well-defined. In addition, the goals of the program were on display.

Instructional Activities and Characteristics

Small-group teaching was the primary instructional method. The teachers reported that since the students were homogeneous in ability levels, and the classes were small, it was not difficult to individualize instruction. The teachers further indicated that maintaining the continuity of instruction was enhanced by the program's five-day weekly schedule. They felt that this continuity was extremely important since handicapped students require constant practice to reinforce the mastery of reading skills and prevent retrenchment.

The paraprofessionals were observed participating in all types of instructional activities--tutorial, small group, and total group. They also assisted with the paperwork.

Consistent with the educational philosophy espoused in the proposal, the instructional methods observed generally involved some type of oral communication: students were seen practicing communication skills directly with teachers and paraprofessionals or receiving auditory feedback through the use of recorders. In some classes the children read stories aloud, taking turns and commenting on the content. Instructional supplies were varied and plentiful. Pupil folders were plainly in evidence and they contained work samples, testing materials, IEPs, and teacher logs.

As observed for the Prescriptive Reading Model, the communication between program teacher and classroom teacher, so important to the success of pull-out programs, proved problematic for the teachers of this model. (See Qualitative Evaluation in Chapter 2.)

Teacher Experience

The teachers of this model were, relative to the other models, experienced. Ninety-six percent of the teachers had three years or more of total teaching experience. However, the program staff was less experienced in special education and compensatory education: 25 percent had two years or less experience in special education and 75 percent had two-years or less experience in compensatory education. As a consequence of this limited related experience, many teachers and paraprofessionals indicated a need for more training in dealing with non-motivated students--especially the EH.

QUANTITATIVE EVALUATION

Five hundred eighty-three students were served in this model. Of these,

12 (2 percent) were truants or low attenders, 33 (6 percent) were discharged, test data were lost for eight (1 percent), and 48 (8 percent) were late admissions. Therefore, complete achievement data were submitted for 482 students (83 percent).

The distribution of the students by region was as follows: 65 students (11.1 percent of the model's population) were served in the Manhattan Region; 64 (11 percent) were served in Brooklyn West; 131 (22.5 percent) in Brooklyn East; 124 (21.3 percent) in the Bronx; and 199 (34.1 percent) in Queens.

The program primarily served elementary school students: 556 students (95.4 percent) were at this school level; the remainder were in junior high school. The age range was seven to 16, with a mean of 10.7 years and a mode of 10 years.

The breakdown of the target population by disability group was as follows: almost 60 percent of the students were NI; 21.6 percent were EMR; 9.8 percent were NIEH; and 5.5 percent were orthopedically impaired (OI).

Attendance Data

All students were scheduled to attend five sessions per week. Session length ranged from 30 to 45 minutes with 54.2 percent attending 45-minute sessions, and 12.7 percent attending 30-minute sessions.

The total number of sessions attended varied from 3 to 143, with a mean of 79, a median of 83, and a mode of 85. The mean percentage of attendance was 81.4 percent.

Achievement Data

The objective of this model proposed that 75 percent of the students would master at least five new skills, as measured by the Individual Pupil Monitoring System (IPMS) published by Houghton Mifflin. Figure 6 presents the graph of the cumulative percentage of the population mastering various numbers of new reading skills. As observed in this figure, the program objective was not attained: the function intersects the five-skill criterion below the 75-percent criterion. As indicated by Table 13, the frequency distribution of total skills mastered in tabular form, exactly 58.3 percent of the student population mastered five or more skills. Further, it was projected that even if data had been collected at the end of June, the criterion still would not have been attained. The mean number of skills mastered was 5.2, the median was 4.9, and the mode was 5.0 attained by approximately one fifth of the students)

The mean percentage of mastery of short-term reading objectives was 74.0 percent; the percentage attempted but failed was 21.3 percent; the percentage not attempted was 4.7 percent.

In rank order, the percentage of students mastering skills in each component of reading were as follows: phonics, 94.2 percent; word analysis, 62.4 percent; comprehension, 30.5 percent; and vocabulary, 0.2 percent. It should be noted that, consistent with the low age of the population, the areas in which most of the students mastered skills were phonics and word analysis--components encompassing elementary skills.

Although the numbers of students in the disability groups were too disparate to permit meaningful statistical analysis, the differences observed among them in mean total mastery were revealing (see Table 14).

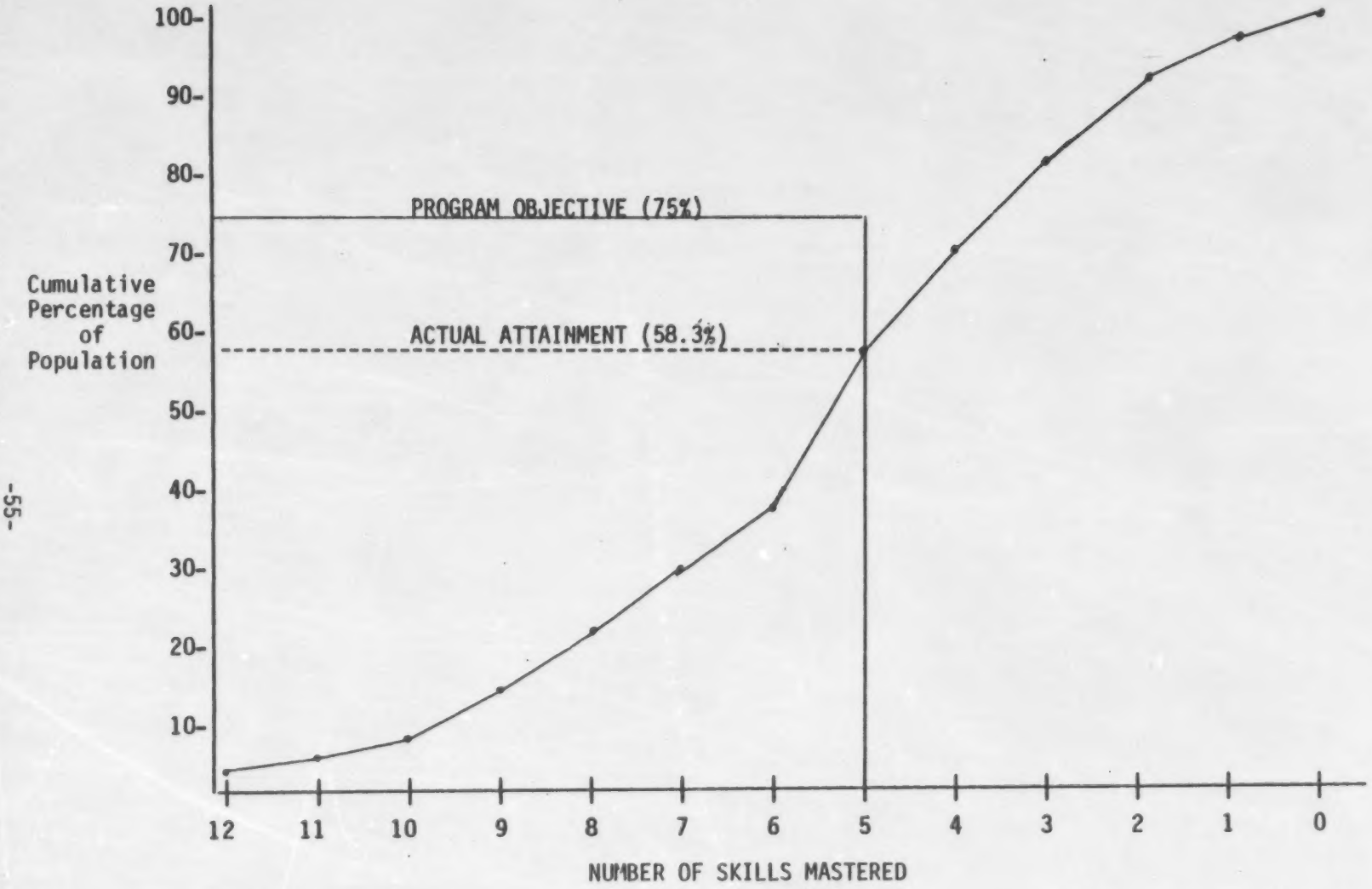


Figure 6. Cumulative frequency distribution of the total number of reading skills mastered by students in the Oral Approach Model (as measured by the IPMS).

TABLE 13

FREQUENCY DISTRIBUTIONS OF THE TOTAL READING SKILLS MASTERED BY STUDENTS IN THE ORAL APPROACH TO READING MODEL
(AS MEASURED BY THE IPMS)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
12	13	2.7	2.7
11	7	1.5	4.2
10	21	4.4	8.6
9	35	7.3	15.9
8	34	7.1	23.0
7	36	7.5	30.5
6	36	7.5	38.0
5	98	20.3	58.3
4	57	11.8	70.1
3	58	12.0	82.1
2	49	10.2	92.3
1	24	5.0	97.3
0	14	2.9	100.2
	482		

TABLE 14

MEAN NUMBER OF READING SKILLS
MASTERED BY DISABILITY

Disability	Number of Students	Skills Mastered
OI	32	8.2
NI	345	4.8
EMR	126	4.3
EH	17	3.5
NIEH	57	2.8

The OI group--students with normal cognitive, learning, and affective skills--showed the highest mean number of skills mastered ($\underline{M}$ = 8.3). The NI and EMR groups followed in rank order; the former mastered a mean of 4.8 reading skills and the latter a mean of 4.3. The EH and NIEH groups mastered means of 3.5 and 2.8 skills, respectively.

VI. BILINGUAL HANDICAPPED

DESCRIPTION

This model was developed to serve approximately 200 eligible handicapped students whose dominant language was Spanish and whose reading ability in that language was below minimum competency. Children were taught in groups of between two and five by a teacher-paraprofessional team.

Instruction was individualized according to baseline performance on the Leamos Spanish Developmental Reading Program. The objective was that 75 percent of the target population would master four objectives in reading Spanish that they had not mastered prior to the program. Ongoing administration of the Leamos was used to measure the attainment of this objective.

QUALITATIVE EVALUATION

Physical Setting, Equipment, and Supplies

Most classes were held in traditional classrooms. Equipment, supplies, and books were all in evidence and in ample supply. Students had well-delineated work areas. Goals, materials, and student work were prominently displayed. Teachers reported that they had adequate and secure storage areas.

Instructional Activities and Characteristics

Instruction was implemented, for the most part, on a one-to-one basis, with teachers and paraprofessionals assisting children individually in the completion of the lessons. Students' folders were available and up-to-date.

Teacher Experience

Most teachers had more than seven years teaching experience. Nearly

all had over three years of teaching both special education and bilingual education.

QUANTITATIVE ANALYSIS

The total number of students served in this program was 244. Of these, 41 (16.8 percent) were truants or low attenders, 9 (3.7 percent) were discharged, and 87 (35.7 percent) were late admissions. Accordingly, complete achievement data were obtained for 105 (43 percent) students.

Sites in four boroughs were served. Sixty-three students (25.8 percent) received instruction in Manhattan, 12 (4.9 percent) in Brooklyn, 154 (63.1 percent) in the Bronx, and 14 (5.7 percent) in Staten Island.

Sixty-six percent of the population was located in elementary schools; 26 percent in intermediate and junior high schools; 8 percent in high schools. The age range of the population was nine to 19 years, with a mean of 12.4 years and a mode of 10.0 years.

NI and EMR students comprised 95.5 percent of the population. The other 4.5 percent were comprised of EH, visually handicapped, and NIEH students.

Attendance

Sessions were scheduled for two, three, or four times per week with 72.5 percent of the sessions held twice weekly; 14.3 percent were held three times a week, and 12.7 percent were held four times a week. The length of the sessions varied between 40 and 45 minutes; 79 percent of the students attended 40-minute sessions.

The mean percentage attendance, excluding truants, discharges, and late admissions, was 69.1 percent.

Achievement Data

The objective of this model was that 75 percent of the population would master four reading objectives in Spanish which they had not previously mastered.

Since 35.7 percent of the students were identified as late admissions, two separate analyses were performed: one on the group for whom complete data were available; another on the late admissions. Figure 7 presents the cumulative frequency distributions of total reading skills mastered by both groups. It was observed that, for the complete-data group, the objective was easily surpassed: indeed 99.1 percent of the students attained the four-skill criterion. Although the objective was not attained for the late admissions, these students did show impressive achievement: almost 60 percent met the four-skill criterion. Table 15 which presents, in tabular form, the total mastery data for the complete-data group indicated that thirty-nine percent mastered nine or more objectives. These students mastered a mean of 7.5 new skills; the mode was five. Table 16, which presents these data for the late admissions, indicated that more than 30 percent mastered at least five new skills. Mean mastery for this group of 4.3 skills; the mode was four. Analysis of the data for the total population revealed that, of the goals listed in each student's IEP, 91.0 percent of those attempted were mastered, 3.6 percent were failed, and 5.4 percent were not attempted. Most of the skills that were mastered were in the area of phonics, including initial and final consonants and vowel sounds; and medial sounds. Skills were mastered at two levels of the fundamental stage of the Leamos: primary and advanced. The majority of skills mastered were at the former level; mean per pupil mastery was 5.5 primary skills and 1.7

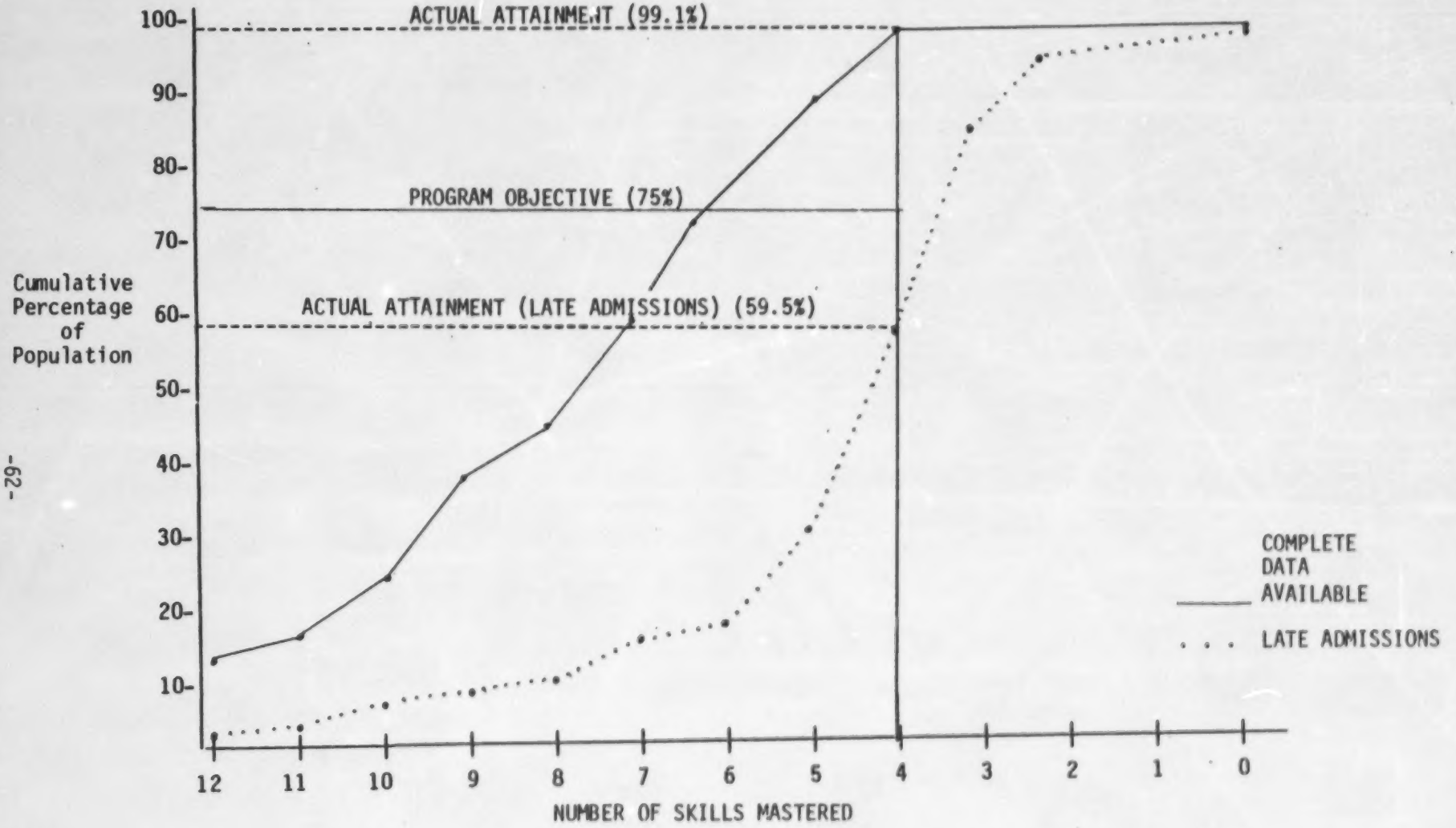


Figure 7. Cumulative frequency distribution of the total number of reading skills mastered by students in the Bilingual Model (as measured by the LEAMOS).

TABLE 15

FREQUENCY DISTRIBUTION OF THE NUMBER OF READING SKILLS MASTERED BY STUDENTS IN THE BILINGUAL MODEL (AS MEASURED BY THE LEAMOS)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
12	13	12.4	12.4
11	5	4.8	17.2
10	7	6.7	23.9
9	16	15.2	39.1
8	5	4.8	43.9
7	17	16.2	60.1
6	13	12.4	72.5
5	18	17.1	89.6
4	10	9.5	99.1
0	1	1.0	100.0
	105		

NOTE: These data are for the complete-data group.

TABLE 16

FREQUENCY DISTRIBUTION OF THE NUMBER OF READING SKILLS MASTERED BY THE BILINGUAL MODEL (AS MEASURED BY THE LEAMOS)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
12	1	1.1	1.1
11	1	1.1	2.2
10	4	4.6	6.8
9	1	1.1	7.9
8	2	2.3	10.2
7	5	5.7	15.9
6	2	2.3	18.2
5	11	12.6	30.8
4	25	28.7	59.5
3	23	26.4	85.9
2	8	9.2	95.1
0	4	4.6	99.7
	87		

advanced skills. Mastery rate, that is the average number of sessions needed to master one new skill, was 5.8 sessions.

Comparisons, through analyses of convariance, of the achievement observed for the two disability groups that comprised most of the population -- EMR (N = 61) and NI (N = 159) revealed no significant differences in the mean total skills mastered and mean rate of mastery, controlling for sessions attended. However, a significant difference was observed in the percentage of mastery: the EMR students mastered an adjusted mean of 79 percent of their IEP goals; the NI students mastered a adjusted mean of 95 percent.

VII. SPECIAL SCHOOLS

DESCRIPTION

This model focused on small-group remediation in the areas of reading, writing, and mathematics for approximately 4,000 eligible handicapped students in special schools. This model, the second largest of the Umbrella, was the only one to provide remediation in three academic areas.

The Special Schools Model operated under the administration of the Office of Citywide Services of the Division of Special Education; a program coordinator was responsible for its direct supervision. Teacher trainers and the coordinator presented monthly workshops and visited the remediation teachers in the special schools to provide demonstration lessons and in-service training. The students' were scheduled for reading or math remediation (but not both) depending upon their relative severity of need in each area. Most of the students received instruction in writing. The program's three objectives proposed that: (1) 80 percent of the target population would master at least one new reading skill for every six weeks of program instruction, as measured by the ongoing administration of the Fountain Valley Support System; (2) 80 percent of the target population would master new skills in writing as determined by a locally-developed test; and (3) 75 percent of the target population would master at least five new skills in math as measured by the Key Math Test.

QUALITATIVE EVALUATION

Physical Setting, Equipment, and Supplies

Nearly half of the classes of this model were held in resource rooms;

regular classrooms made up the next largest category of settings, followed by offices, a shared room, and a library.

The sites were well-equipped and teachers reported, for the most part, that they had received their supplies with reasonable promptness. Those teachers whose supplies had not been delivered punctually reported that they either made their own, or used available substitutions until the supplies arrived. Storage space was secure in nearly all of the sites.

Well-defined student work areas were evident in nearly all sites and student work and the program goals were prominently displayed as were the program goals.

Instructional Activities and Characteristics

Teacher-paraprofessional teams provided remedial instruction on a one-to-one and small-group basis. Observations by field consultants revealed that the instructional materials employed were appropriate to the students' short-term goals which were established through baseline data collection. For the most part, teachers indicated that the materials were effective; however, some complained that the subject matter was socially immature. Many teachers reported that most low-level published reading materials are geared to the younger child, making it difficult to find stimulating material for older students. Accordingly, the teachers frequently resorted to developing their own materials.

Student folders were well-maintained, complete, and up-to-date. They contained samples of work, test materials, IEPs, and, generally, a teacher's log. Planbooks were up-to-date and provided for individual instruction.

Teacher Experience

The teachers of this model were, relative to the other models, experienced. Over 90 percent had at least three years of prior teaching experience; three-quarters had over three years of experience with the handicapped. None of the teachers were in their first year of teaching.

QUANTITATIVE EVALUATION

Reading

Thirty-two hundred students were provided with remedial-reading instruction at 51 sites in four boroughs. The geographical distribution by bourough of the students was as follows: 990 (30.9 percent) in Manhattan; 1306 (40.8 percent) in Brooklyn; 643 (20.1 percent) in the Bronx; and 184 (5.7 percent) in Queens. Of these 3,200 students, 173 were truants of low attenders (5.4 percent), 580 were discharged (18.1 percent), and 301 were admitted late (9.4 percent). Thus, complete achievement data were submitted for 2135 (66.7 percent) students. It should be noted that a characteristic of the special schools and, consequently, this model was frequent population turn-over.

The age range of the students receiving reading instruction was five to 21 years with a mean of 15 years; the mode was 16. Accordingly, relative to the other reading models of the Umbrella, this population was comprised of older students. The incidence of specific disabilities among the population was as follows: 2147 students (67.9 percent) were classified as EH; 412 (13 percent) were EMR; 333 (10.5 percent) were speech, hearing, language impaired and (SHLIC); and 106 (3.4 percent) were NIEH.

Attendance. Instructional sessions were scheduled either four or five times per week: 84.5 percent of the students attended five times per week; 14.7 percent attended four times per week. The length of instructional sessions averaged 30 minutes.

The number of instructional sessions attended ranged from one to 178. The mean number of sessions attended was 87.5, while the median was 90.9. The overall percentage of attendance, excluding truants, late admissions, and discharges, was 80.1 percent; the percentage of attendance for the total population was 74.2 percent.

Reading Achievement. The objective of this program was that 80 percent of the students would master at least one new reading skill each six weeks of instruction. Figure 8 presents the cumulative frequency distribution of the reading mastery rate (i.e., mean number of reading skills mastered per six weeks of instruction) for the Special-Schools Reading Model students. As observed in this figure, the function for mastery rate easily surpasses the criterion for the program objective. Indeed, as indicated in Figure 8 and Table 17 (which presents the same data in tabular form), 92.4 percent of the students surpassed the six-week criterion. More than one third of the students (33.7 percent) showed a mastery rate that was double the criterion value (i.e., two skills per six weeks). As indicated by Table 18, the frequency distribution of the total number of reading skills mastered, 70.6 percent of the students mastered at least five new skills. The mean and median for total skills mastered were 6.7, while the mode was 12 (achieved by 11.1 percent of the students.)

The number of skills mastered was highly correlated (r = .73) with the total number of sessions attended; over 53 percent of the variance in total mastery was accounted for by the number of sessions attended. Hence, the program had a compelling effect upon achievement. The rate of skills mastery was inversely related to number of sessions attended (r = -.35). That is, skills were mastered at a faster rate during the early stages of intervention, with a slowing of the rate of growth during the later sessions. Age had virtually no effect upon achievement.

The mean percentage of short-term reading objectives listed in each student's IEP that were achieved was 77.2 percent; the percentage of skills attempted and failed was 17.8 percent, while the percentage of skills not attempted was 5 percent.

Table 19 presents the percentage of students mastering skills in the five component areas of reading and the mean number of skills mastered in each area by these students (i.e., the segment of the population that showed mastery in a given area). The component in which the largest percentage of students (69.4 percent) mastered skills was comprehension, followed by vocabulary (55.6 percent), and phonics (43 percent).

Significant differences in the mean number of total reading skills mastered were observed among the five major disability groups represented in the population. Table 20 presents a summary of the post-hoc statistical comparisons of the mean number of reading skills mastered (adjusted to control for differences in sessions attended) among the groups of NIEH, EH, EMR, NI, and SHLIC students. The mean observed for the NIEH group was

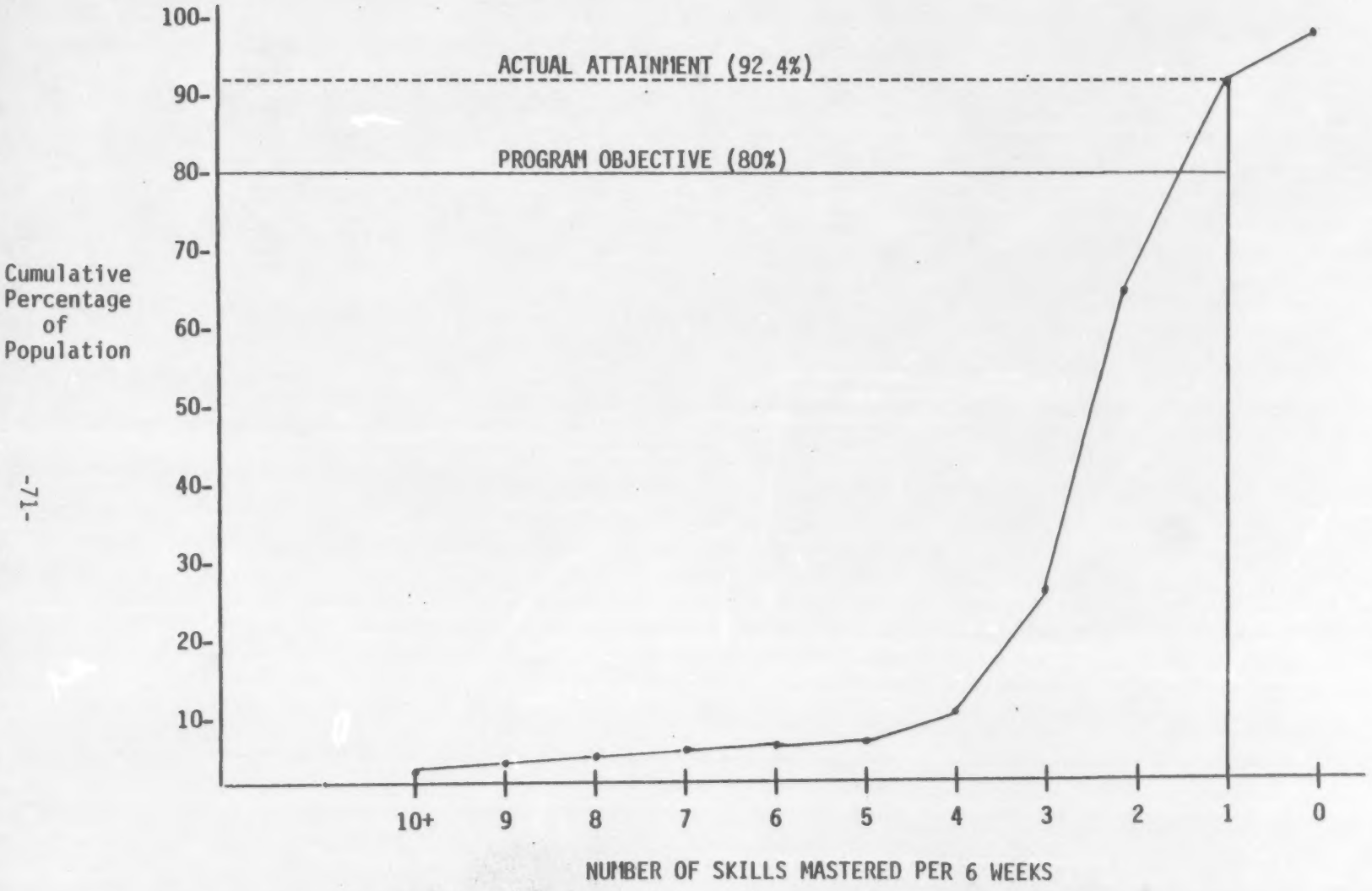


Figure 8. Cumulative frequency distribution of the number of reading skills mastered for each six weeks of instruction for the Special-Schools students (as measured by the Fountain Valley).

TABLE 17

FREQUENCY DISTRIBUTION OF THE NUMBER OF SKILLS MASTERED FOR EACH SIX WEEKS OF INSTRUCTION BY THE SPECIAL-SCHOOLS STUDENTS (AS MEASURED BY THE FOUNTAIN VALLEY)

Number of Skills Mastered per 6 Weeks	Number of Students	Relative Percent	Cumulative Percent
10+	40	1.9	1.9
9	10	0.4	2.3
8	9	0.4	2.7
7	14	0.7	3.4
6	37	1.7	5.1
5	49	2.3	7.4
4	117	5.5	12.9
3	350	16.4	29.3
2	719	33.7	63.0
1	628	29.4	92.4
0	162	7.6	100.0

TABLE 18

FREQUENCY DISTRIBUTION OF THE TOTAL NUMBER OF READING SKILLS MASTERED BY THE SPECIAL-SCHOOLS STUDENTS

Number of Skills Mastered	Number of Students	Relative Percent	Cumulative Percent
12	238	11.1	11.1
11	149	7.0	18.1
10	158	7.4	25.5
9	171	8.0	33.5
8	178	8.3	41.8
7	204	9.6	51.4
6	216	10.1	61.5
5	194	9.1	70.6
4	170	8.0	78.6
3	160	7.5	86.1
2	144	6.7	92.8
1	84	3.9	96.7
0	69	3.2	99.9
	2135	100.0	

TABLE 19

PERCENTAGE OF STUDENTS MASTERING SKILLS
AND THE MEAN NUMBER OF SKILLS
MASTERED BY READING COMPONENT

Reading Component	Percentage of Students Mastering Skills	Mean Number of Skills Mastered
Comprehension	69.4	3.1
Vocabulary	55.6	2.4
Phonics	43.0	4.6
Word Analysis	32.6	2.6
Study Skills	19.9	2.0

NOTE: Means are for those students that mastered skills in each component

TABLE 20

COMPARISONS OF THE ADJUSTED MEAN NUMBER OF READING SKILLS MASTERED AMONG FIVE DISABILITY GROUPS (NEWMAN-KEULS PROCEDURE)

		NIEH	EH	EMR	NI	SHLIC
	Mean	4.32	5.11	5.87	5.88	6.21
NIEH	4.32	-	0.79**	1.55**	1.56**	1.89**
EH	5.11		-	0.76**	0.77**	1.10**
EMR	5.87			-	0.01	0.34
NI	5.88				-	0.33
SHLIC	6.21					-

NOTE: Means have been adjusted to control for differences in sessions attended among the groups.

- The NIEH group mastered significantly fewer new reading skills than the other four disability groups.
- The EH group mastered significantly fewer reading skills than the EMR, NI, and SHLIC students.
- There were no significant differences in mean mastery among the EMR, NI, and SHLIC groups.

significantly lower than those for the other four groups. The mean for the EH students was significantly lower than those for the EMR, NI, and SHLIC groups; the means for the latter three groups did not differ significantly.

Mathematics

The total number of students for whom mathematics achievement data were submitted was 566. Of these, 52 (9.2 percent) were truants or low attenders, 31 (5.5 percent) were discharged, and six (1.1 percent) were late admissions. Thus, complete achievement data were reported for 477 students (84.3 percent).

Ten sites in four boroughs were included in the remedial math model. More than 39 percent of the students served were located in Manhattan; 35.5 percent were in Brooklyn. The remaining students were located in the Bronx (14.1 percent) and Queens (11 percent).

The school levels of these students were either intermediate or secondary: 21.1 percent were at the former level; 78.9 percent were at the latter. The age range was nine to 23 years with a mean of 16.9 years. More than half of the students (51.2 percent) were classified as EH; 15 percent were EMR, 12 percent were SLD, 8 percent deaf, and 8 percent NIEH.

Attendance. Mathematics sessions were scheduled for three, four, or five times per week. Fifty-two percent of the students attended three sessions per week, 13 percent four times per week, and 35 percent five times per week. The length of sessions varied from 40 to 50 minutes, with 68 percent of the sites reporting-session length of 45 minutes.

The number of sessions attended ranged from 0 to 145, with a mean of 45 sessions; the median was 35.4 sessions, while the mode was 30. Excluding truants, late admissions, and discharges, the mean percentage of attendance was 74.9 percent.

Math Achievement. The objective of this model was that 75 percent of the target population would achieve at least five new objectives in mathematics, as measured by the Key Math Test. As observed in Figure 9, the cumulative frequency distribution of total skills mastered, the objective was not attained: only 62.7 percent of the students met the five-skill criterion. Table 21, which presents the same data in tabular form indicated that 54.7 percent of the students mastered between six and 12 skills. The mean number of new skills mastered was 6.2; the mode was four.

The percentage of short-term math objectives listed in each student's IEP that were achieved was 62.4 percent; the percentage of objectives attempted and failed was 23.3 percent; the percentage of objectives not attempted was 14.3 percent. The rate of mastery was, on average, one new skill every 6.5 sessions (i.e., one skill was mastered in a little less than two weeks of instructional time).

Table 22 presents the math topics that were taught and the percentage of students mastering objectives within these areas. Most of the students mastered basic computational skills and numeric concepts: 56.4 percent mastered skills in addition; 47 percent in subtraction; 27.5 percent in multiplication; and 31.7 percent in number concepts.

Attending the program accounted for 31 percent of the variance in

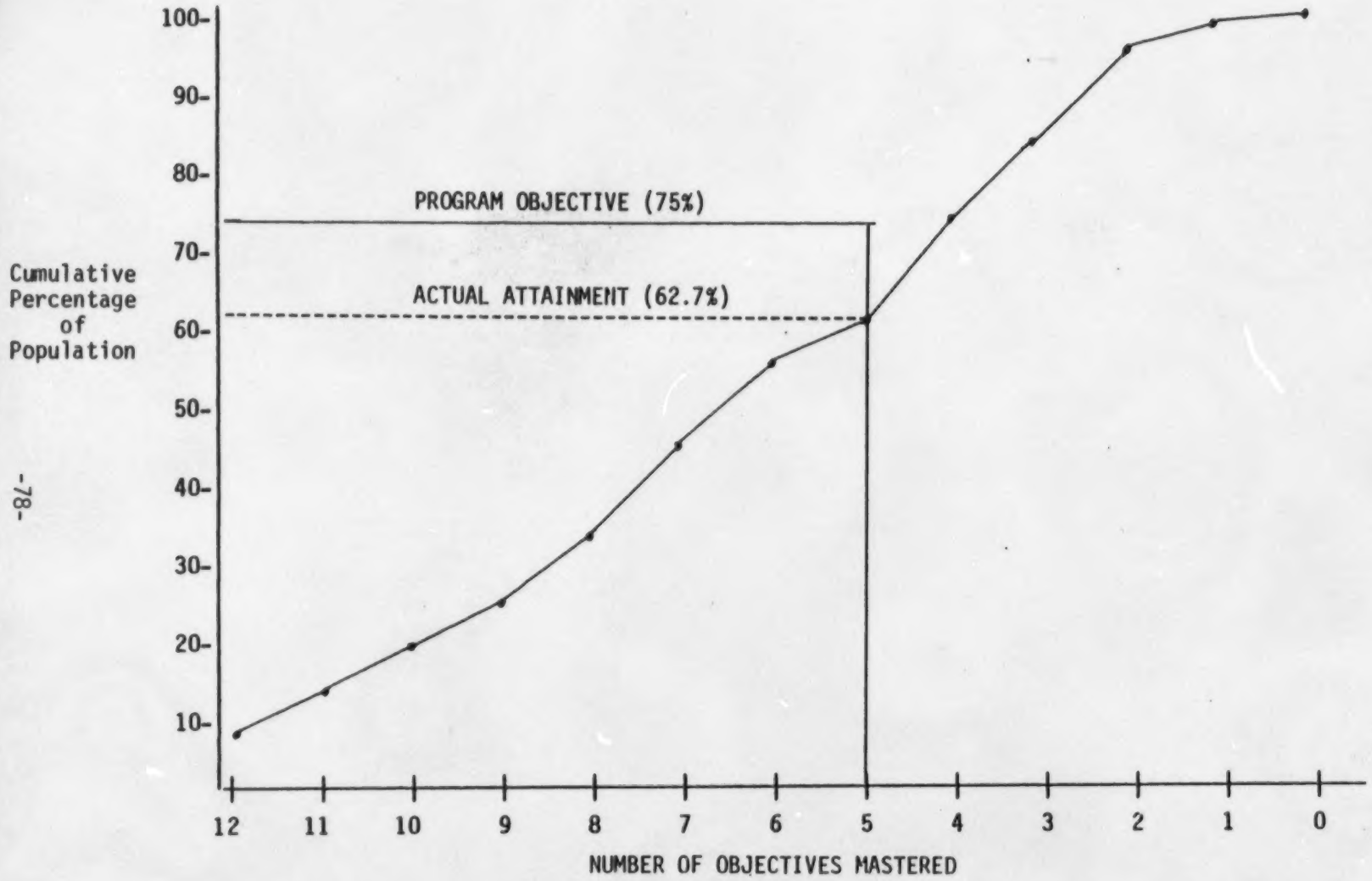


Figure 9. Cumulative frequency distribution of the total math skills mastered by the Special-Schools students (as measured by the Key Math Test).

TABLE 21

FREQUENCY DISTRIBUTION OF THE NUMBER OF READING SKILLS MASTERED BY THE SPECIAL SCHOOLS STUDENTS (AS MEASURED BY THE KEY MATH)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
12	44	9.2	9.2
11	25	5.2	14.4
10	28	5.9	20.3
9	24	5.0	25.3
8	47	9.9	35.2
7	54	11.3	46.5
6	39	8.2	54.7
5	38	8.0	62.7
4	59	12.4	75.1
3	38	8.0	83.1
2	55	11.5	94.6
1	12	2.5	97.1
0	14	2.9	100.0
	477		

TABLE 22

PERCENTAGE OF STUDENTS THAT MASTERED SKILLS BY TOPIC

Topic	Percentage of Students
Addition	56.4
Subtraction	47.0
Number Concepts	31.7
Multiplication	27.5
Fractions	26.2
Geometry	22.4
Money	21.6
Division	16.6
Time	11.3
Measurement	8.8
Mental Computation	5.5
Word Problems	4.0
Numerical Reasoning	3.1
Missing Elements	0.2

skills mastery; the correlation coefficient between mastery and sessions attended was .56, (df = 565, p<.001). Attendance was the variable of greatest significance in determining mastery. The rate of mastery was inversely related to the sessions attended (r = -.31, n = 565, p<.001). That is, skills were mastered at a faster rate during the early stages of intervention, with a slowing of the growth rate during the later sessions.

The correlation between student age and the number of objectives mastered was 0.07 (N = 565, p<.05). Although the correlation was statistically significant, only five percent of the variance between these variables was shared. Thus, the relationship between skills mastery and age was not educationally meaningful.

Significant differences were observed in the adjusted mean number of math skills mastered among the five major disability groups (see Table 23): The NIEH group mastered significantly fewer math skills than the other four groups (i.e., EH, deaf, EMR, and SLD). The EH students mastered significantly fewer skills than either the EMR or SLD students. There were no significant differences among the deaf, EMR, and SLD groups.

Writing

A total of 3,112 students received remediation in writing. Almost 30 percent of these students resided in Manhattan, while 31.4 percent were in Queens; 8.4 percent and 5.8 percent were in the Bronx and Staten Island, respectively.

Of the total group, 169 (5.4 percent) were truants or low attenders, 544 (17.5 percent) were discharged, and 272 (8.7 percent) were late admis-

TABLE 23

COMPARISONS OF THE ADJUSTED MEAN NUMBER OF MATH SKILLS MASTERED AMONG THE FIVE DISABILITY GROUPS (NEWMAN-KEULS PROCEDURE)

		NIEH	EH	DEAF	EMR	SLD
	MEAN	4.49	5.63	6.79	6.99	8.00
NIEH	4.49	-	1.14*	2.30**	2.50**	3.51**
EH	5.63		-	0.16	1.36*	2.37**
DEAF	6.79			-	0.20	1.21
EMR	6.99				-	1.01
SLD	8.00					-

*$p < .01$
**$p < .05$

NOTE: The means have been adjusted for differences in sessions attended among the groups.

- The adjusted mean number of math skills mastered by the NIEH group was significantly lower than than those for the other four groups.
- The adjusted mean for the EH group was significantly lower than those for the EMR and SLD but not significantly different from the mean for the deaf.
- The means for the deaf, EMR, and SLD groups did not differ significantly.

sions. Thus, complete writing achievement data were available for 2,125 (68.3 percent) of the 3,112 students.

The age range for this population was six to 22 years, with a mean of 14.9 years; the median was 15.2 years and the mode was 16.0 years. The breakdown by disability group was: 68.1 percent EH; 12.2 percent EMR; 10.8 percent SHLIC; 3.4 percent NIEH. Other disabilities such as deaf, visually handicapped, SLD, NI, and MH (multiply handicapped) comprised the other 5.5 percent.

Attendance. Students were scheduled for three, four, or five sessions of writing instruction per week; 1,772 students (83.4 percent) attended five times per week. Session length ranged from five to 75 minutes. The mean session length was 14.6 minutes and the mode was 10.0 minutes.

The number of instructional sessions attended for the population ranged from one to 178. For the students for whom complete data were available, the mean number of sessions attended was 87.8, the median 91.1, and the mode 100.0. The mean percentage attendance, excluding truants, dishcarges, and late admissions, was 81.0 percent.

Achievement. The objective of this program was that 80 percent of the target population would master new skills in writing as measured by a locally-developed criterion-referenced test. The instrument was designed by two members of the English department at a local university in consultation with staff of the Office of Educational Evaluation and the Division of Special Education.

Table 24 presents the frequency distribution of total writing skills mastered. Ninety-seven percent of the students mastered at least one

TABLE 24

FREQUENCY DISTRIBUTION OF THE NUMBER OF WRITING SKILLS MASTERED BY THE SPECIAL-SCHOOLS STUDENTS

Number of Skills Mastered	Number of Students	Relative Percent	Cumulative Percent
12	62	2.9	2.9
11	22	1.0	3.9
10	52	2.4	6.3
9	79	3.7	10.0
8	127	6.0	16.0
7	206	9.7	25.7
6	225	10.6	36.3
5	243	11.4	47.7
4	263	12.4	60.1
3	328	15.4	75.5
2	275	12.9	88.4
1	182	8.6	97.0
0	61	2.9	99.0
TOTAL	2125	99.9	

new writing skill; only three percent failed to show any growth. Thus, the 80-percent criterion was easily surpassed. The mean number of skills mastered was 4.7; the mode was three.

Table 25 lists the percentage of students mastering objectives within specific components of writing. Most of the skills that were mastered related to the basic mechanics of writing. Simple sentences comprised the component in which the largest percentage of students (77.3 percent) mastered specific skills. Almost 48 percent mastered skills in writing letters and words--the most elementary component--while 20 percent showed mastery in writing paragraphs. The number of skills mastered was highly correlated (r = .53) to the number of sessions attended; 28 percent of the variance in writing mastery was accounted for by program attendance. The percentage of short-term writing objectives that were listed in each student's IEP that were achieved was 81.1 percent; the percentage of those objectives attempted and failed was 17.6 percent; the percentage not attempted was 1.3 percent. The mean mastery rate, (i.e., the number of sessions needed to master one new writing skills) was 14.3 sessions. A significant inverse relationship was observed between mastery rate and number of sessions attended (r = -.21). That is, those students who attended relatively more sessions showed a slower rate of mastery. Age was not significantly correlated with skills mastery (r = -0.08).

There were significant differences in total skills mastered among groups of students categorized by specific disability. Table 26 presents post-hoc comparisons of the mean adjusted total mastery scores among four disability groups: NIEH, EMR, EH, and SHLIC.

TABLE 25

THE PERCENTAGE OF STUDENTS MASTERING SKILLS
BY WRITING COMPONENT

Component	Percentage of Students Showing Mastery
Simple sentences	77.3
Writing letters and words	47.6
Paragraphs	20.1
The letter	10.9
Component-complex sentences	7.1
Advanced mechanics and punctuation	1.9
The essay	1.8
The poem, short story, and report	1.1

TABLE 26

COMPARISONS OF ADJUSTED MEAN TOTAL WRITING SKILLS MASTERED AMONG FOUR DISABILITY GROUPS (NEWMAN-KEULS PROCEDURE)

		NIEH	EMR	EH	SHLIC
	MEAN	2.32	4.23	4.75	5.70
NIEH	2.32	-	1.91**	2.43**	3.38**
EMR	4.23		-	0.52	1.47**
EH	4.75			-	0.95*
SHLIC	5.70				-

*$p > .05$
**$p > .01$

NOTE . Means were adjusted for differences among the groups in sessions attended.

. The SHLIC group mastered significantly more writing skills than the other three groups.

. The NIEH group mastered significantly fewer writing skills than the other three groups.

The adjusted mean observed for the SHLIC group (5.70 skills) was significantly higher than those observed for the other three groups. Conversely, the mean for the NIEH group (2.32) was significantly lower than those for the other groups. The means for the EMR and EH groups did not differ significantly.

VIII. NON-PUBLIC SCHOOLS

DESCRIPTION

Approximately 550 eligible handicapped children who attended non-public schools received remedial reading under this model. In addition, for those students who manifested a need, supplementary speech services were provided. Each remedial-reading teacher served a total of 20 students per week in groups of from one to three pupils. The program's goal was to promote the mastery of specific readiness and reading skills. The objective for this model proposed that by June 30, 1981, 75 percent of the target population would have mastered four objectives in reading which they had not mastered prior to the program, as measured by the ongoing administration of the Wisconsin Design Skills Development Test (WDSDT).

QUALITATIVE EVALUATION

Physical Setting, Equipment, and Supplies

Students were served in a wide variety of facilities and settings, including a synagogue, an oversized cubicle, a large group facility, and a converted nurse's office; two were held in regular classrooms. In addition, other classes were conducted in offices or resource rooms.

Overall, these facilities were stocked with a substantial quantity and variety of instructional materials and equipment. However, some teachers noted supply problems including late delivery and materials that were inappropriate for the pupils served. As an obvious example,

in one instance aural materials were sent to a program for deaf children. Storage space was adequate for the majority of sites.

Students' work areas were well-defined but since, according to the teachers, the physical settings were often not conducive, the goals of the program were not displayed, nor were samples of the students' work.

Instructional Activities and Characteristics

The students were taught individually at all but one of the observed sites. There were no paraprofessionals in this model.

Activities in which students were observed included word pronunciation, story reading, comprehension skills, and work games. Some older students were using workbooks designed to teach them how to fill out job applications. Up-to-date planbooks clearly related to the objectives of the program.

Student folders were available, complete, and up-to-date, containing samples of the students' work, testing materials, and IEPs.

Teacher Experience

All of the teachers had received training in special education. No teacher had less than one year of teaching experience and 85 percent had more than three. Moreover, all teachers had at least one year of experience teaching in special education; 70 percent had more than three.

QUANTITATIVE EVALUATION

Data were reported for a total of 552 students served in this model.

Fifty-three (9.6 percent) of these students were truants or low attenders, 26 (4.7 percent) were discharged, 67 (12.1 percent) were late admissions, and 2 had missing data. Thus, complete achievement data were reported for 404 students (73.2 percent).

The age range of the population was between six and 19 years. The mean and median were 12.7 years and the mode 12.0 years.

The most frequently observed categories of disability were: NIEH (29.6 percent); EMR (24.5 percent); EH (17.8 percent); and SLD (13.3 percent). The remaining categories included NI, MH, deaf, and partially sighted.

Attendance

Each student was scheduled to attend two sessions per week. Session length ranged from 30 to 45 minutes, with 72.3 percent reporting 30-minute sessions. The total number of sessions attended ranged from zero to 71, with a mean of 43.5 sessions; the median was 46.3 sessions, while the mode was 52.0. Excluding truants, late admissions, and discharges, the mean percentage attendance was 90.1 percent; including these groups, the mean percentage was 85.2 percent.

Achievement

The objective of this program was that 75 percent of the population would master at least four new objectives in reading. Figure 10 presents the cumulative frequency distribution of total skills mastered. As indicated, the cumulative frequency function intersects the four-skill criterion above the proposed criterion level. That is, more than 75 percent of the students attained the criterion.

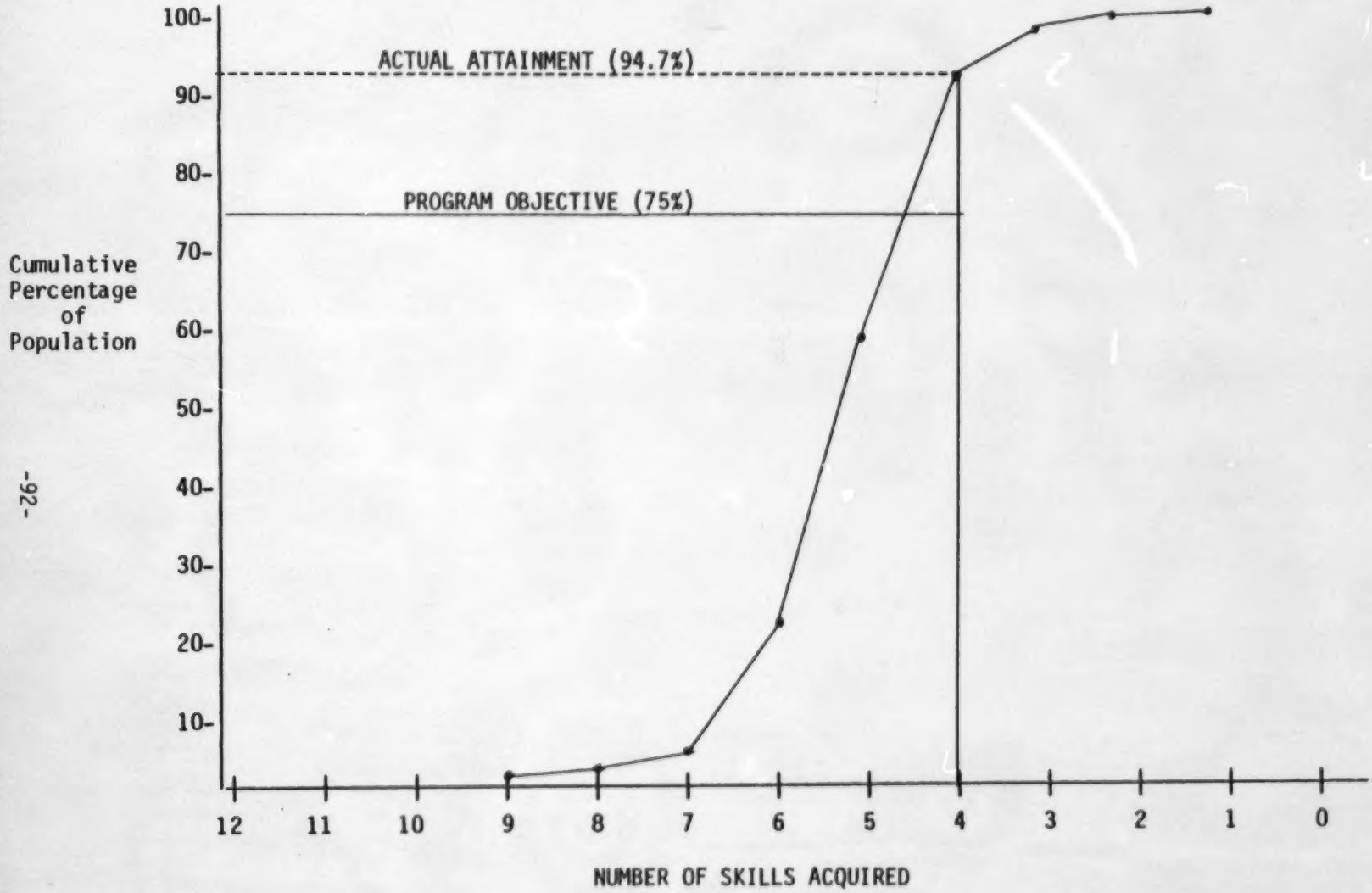


Figure 10. Cumulative frequency distribution of the total reading skills mastered by the Non-Public School students (as measured by the WSDST).

Table 27, which presents these data in tabular form, indicated that exactly 94.7 percent of the students attained the four-skill criterion. The mean number of skills mastered was 4.8; the median was 4.7 and the mode was 5.0. The range of mastery was between one and nine skills; indeed, everyone mastered at least one.

Of the short-term goals listed in each student's IEP, an average of 76 percent were mastered; 22.4 percent were failed, and 1.6 percent were not attempted. On average, ten sessions were needed to master one new objective. This is approximately five hours of instructional time, at two sessions per week, five weeks of remediation.

Comprehension and phonics were the components in which mastery occurred most frequently: 87.1 percent of the students showed mastery in the former; 78.7 percent in the latter. Over 54 percent mastered vocabulary skills.

In this model, age had no significant effects upon total skills mastered, rate of learning, or percentage of skills mastered. Similarly, no significant effects upon these dependent measures were found for type of disability.

Attendance in the program, as measured by total sessions attended, accounted for 23.6 percent of the variance in total skills mastered. (r = .49). A small but significant inverse correlation (r = -.18) was observed between sessions attended and mastery rate. That is, the rate of mastery was faster for those students at the low end of the sessions-attended continuum; conversely, those with more sessions attended tended to have slower mastery rates.

TABLE 27

FREQUENCY DISTRIBUTION OF THE TOTAL NUMBER OF READING SKILLS MASTERED BY THE NON-PUBLIC SCHOOL STUDENTS (AS MEASURED BY THE WDSDT)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
9	1	0.2	0.2
8	7	1.7	1.9
7	19	4.7	6.6
6	59	14.6	21.5
5	152	37.6	58.8
4	145	35.9	94.7
3	14	3.5	98.2
2	6	1.5	99.7
1	1	0.2	99.9
	404		

IX. PRESCRIPTIVE MATH

DESCRIPTION

Although it was determined that for most eligible handicapped children the priority area for compensatory education was reading, data indicated that there was also an urgent need for remediation in math. Accordingly, an experimental math component was developed to meet the needs of children at selected sites; this was the first year that supplementary math services were included in the Title I program for the handicapped. Ninety remedial-math teaching positions were allocated. Each teacher, aided by an educational assistant, served 45 children in small groups (4-8 students) and individually. Approximately 3,500 eligible handicapped children in grades three thru 12 received remedial math instruction.

In order to accommodate both reading and math components without duplicating services (i.e., providing students with both reading and math instruction), sites selected for the math model were those which had at least 90 eligible handicapped students--45 received Prescriptive Reading instruction and 45 received Prescriptive Math instruction. This model was administered by the Title I program manager and the Title I Prescriptive Reading coordinators who were funded through the Prescriptive Reading Model.

QUALITATIVE EVALUATION

Physical Setting, Equipment, and Supplies

Nearly 50 percent of these classes were held in regular classrooms; classes were also held in resource rooms, offices, and various other facilities. Although observations revealed that most of the rooms were large, uncluttered, bright, and clean, a few were so inappropriate

as to be dangerous to students: two classes were held in shop rooms with shop equipment easily accessible to the pupils; the kitchen of a home economics class housed another. In still another case there was no room scheduled for the program; the teacher used any room available.

Equipment and supplies were available in sufficient quantity and variety. However over 25 percent of the teachers said their supplies had arrived late, causing problems in program planning. Storage space was usually secure and of sufficient volume.

Most of the rooms were well-organized: student areas were well-defined; the goals of the program were displayed. However, only 75 percent of the rooms had student work displayed.

Instructional Activities and Characteristics

Over half of the students were taught on an individual basis by teacher-paraprofessional teams. Other methods used were total group instruction followed by individualized or small group lessons. Students were observed in instructional activities focused around a variety of methods and materials including: clocks, money, math games, and supermarket tapes; fractions; and the collection of baseline and posttest data. A prescriptive-diagnostic methodology, similar to that described for the Prescriptive Reading Model, was employed. Planbooks were up-to-date, planned for individual instruction, and appropriate to the instructional objectives.

As indicated in previous sections of this report, communication between the remediation teachers and the tax-levy classroom teachers is extremely important to the success of any pull-out program. While many Title I remedial-math teachers reported that adequate communication did take

place, others indicated a minimum of meaningful contact and, consequently, a lack of coordination of instructional services.

Students' folders were in evidence and contained samples of work, testing materials, IEPs, lesson plans, and teacher logs. Paraprofessionals were usually observed performing individual tutoring, they also worked with small groups and performed clerical chores.

Teacher Experience

Forty percent of these teachers had two years or less experience in the field of teaching and 60 percent had less than two years of teaching in special education. Eighty percent had less than one year of experience in remedial math programs.

Interviews revealed that many teachers, due to inexperience, felt not adequately prepared to deal with some of the problems that arose. Specifically, at many sites--particularly high schools--serious behavior problems were observed in both the Title I classes and the schools in general. Those teachers with little experience reported that they did not feel prepared to handle these problems.

QUANTITATIVE EVALUATION

Data were reported for 3,681 students. Of these, 395 (10.7 percent) were truants or low attenders, 347 (9.4 percent) were discharged, and 198 (5.4 percent) were late admissions. Thus, complete achievement data were submitted for 2,728 (74.1 percent).

The distribution of students by region was as follows: 566 students (15.4 percent) were served in the Manhattan Region; 587 (15.9 percent) and 611 (16.6 percent) in Brooklyn East and Brooklyn West, respectively; 1,119 (30.4 percent) in the Bronx; 613 (16.7 percent) in Queens; and 183

(5 percent) in Staten Island. Almost 19 percent of the population was in elementary schools, 24.9 percent and 31.2 percent in intermediate and junior high schools, respectively, and 23.8 percent in high schools. The students ranged in age from five through twenty-one years; the mean was 14.1 and the mode was 14.

Although virtually every type of mild and moderate disability was represented, the population was mainly comprised of five disability groups: NI (40.5 percent); EMR (19.8 percent); EH (19.5 percent); NIEH (10.9 percent); and SLD (5.6 percent).

Attendance

Sessions were scheduled for three, four, or five times per week with 2,972 (80.7 percent) attending three times a week. One hundred sixty-nine (4.6 percent) attended four times a week, and 499 (13.6 percent) attended five times a week. The length of sessions ranged from 40 to 45 minutes with 2,289 (62.2 percent) of the students attending 45-minute sessions.

The range of total sessions attended was between one and 140; the mean was 45, the median was 40, and the mode was 20. Wide variation in mean percentage attendance and total sessions attended were observed among the six regions. Staten Island's students showed the largest mean number of sessions attended (66.9) and the highest mean percentage attendance (79.5 percent). Queens was second in both categories with a mean sessions attended of 43.7 and a mean percentage attendance of 73.1 percent. Relatively similar means were observed in both variables

among the other four regions: the mean number of sessions attended was 36.5, 33.2, 31.3, and 31 for the Bronx, Brooklyn West, Manhattan, and Brooklyn East, respectively; the mean percentage attendance was 66.3 percent, 68.2 percent, 66.2 percent, and 69.3 percent, respectively.

Achievement

The objective of this program was that 75 percent of the population would master at least five new skills in math. The cumulative frequency distribution of total skills mastered (see Figure 11 and Table 28) indicated that 74.7 percent (which was rounded off to 75 percent) of the students attained the five-skill criterion. Thus, the objective for the Prescriptive Math Model was attained. Indeed, more than one-half of the students mastered at least seven new skills. The mean number of total skills mastered was 7.1; impressively, the mode was twelve (512 students and 18.8 percent of the population).

The percentage of short-term goals listed in each student's IEP that were achieved was 77 percent; the percentage failed was 13.5 percent; the percentage not attempted was 9.5 percent. One objective was mastered on an average of every 7.7 sessions. That is, it took approximately five hours, on average, or a little over two weeks to master one new skill.

Table 29 presents the percentage of students that mastered skills in various content areas of mathematics. The objectives that were most frequently mastered pertained to basic computational skills including: subtraction (57 percent); addition (55 percent); multiplication (43 percent); and division (33 percent). Instructional emphasis was also

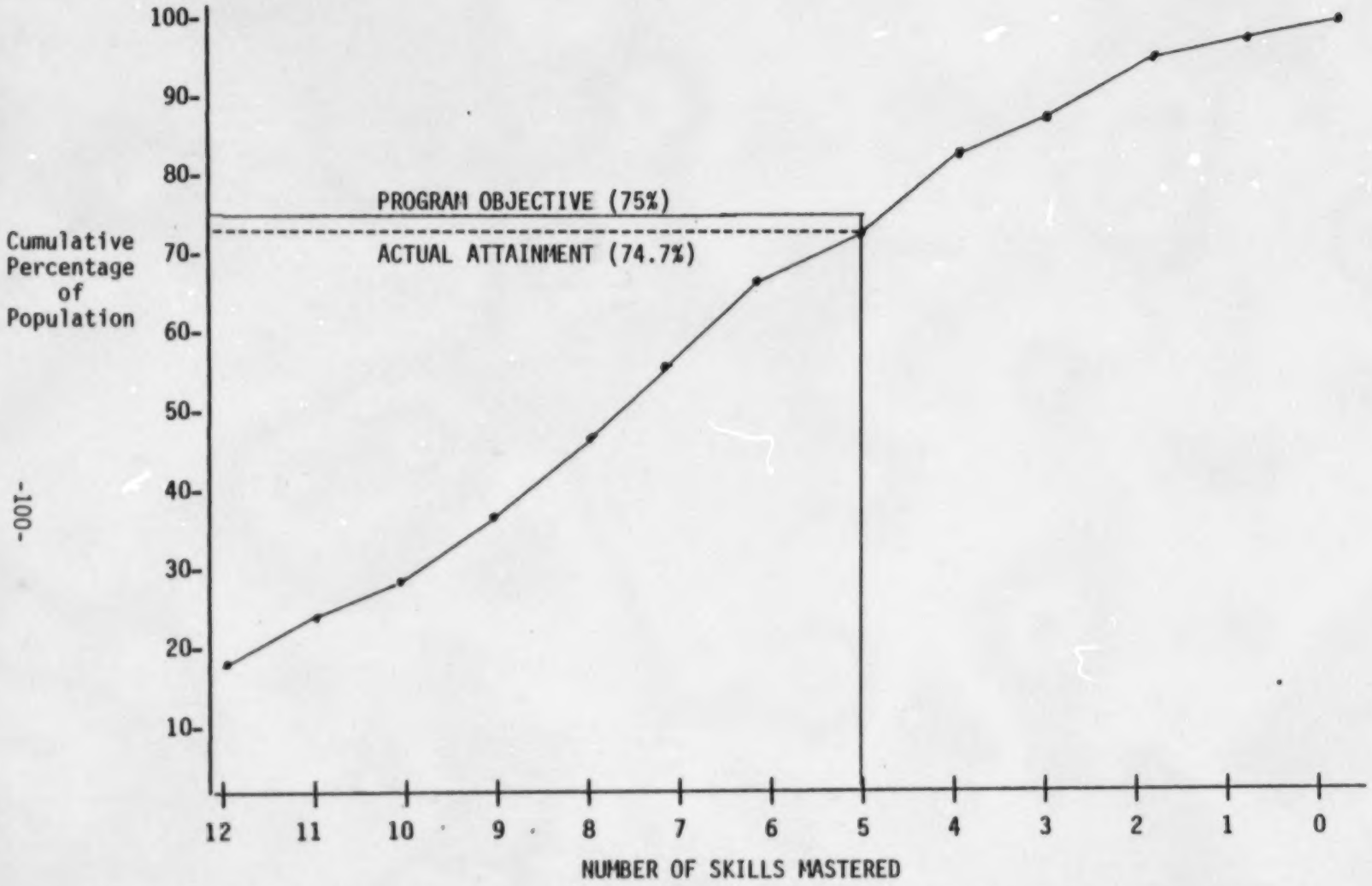


Figure 11. Cumulative frequency distribution of total math skills mastered by the Prescriptive Math Model students (as measured by the Key Math Test).

TABLE 28

FREQUENCY DISTRIBUTION OF THE TOTAL NUMBER OF READING SKILLS MASTERED BY THE PRESCRIPTIVE MATH STUDENTS (AS MEASURED BY THE KEY MATH TEST)

Number of Skills Mastered	Number of Students	Relative Percent	Cumulative Percent
12	512	18.8	18.8
11	117	4.3	23.1
10	174	6.4	29.5
9	225	8.2	37.7
8	232	8.5	46.2
7	229	8.4	54.6
6	292	10.7	65.3
5	256	9.4	74.7
4	211	7.7	82.4
3	195	7.1	89.5
2	147	5.4	94.9
1	82	3.0	97.9
0	56	2.1	100.0
	2728		

TABLE 29

PERCENTAGE OF STUDENTS MASTERING SKILLS
BY CONTENT AREAS

Content Areas	Percentage of Students Showing Mastery
Subtraction	57.0
Addition	55.2
Multiplication	43.3
Division	33.0
Money	27.6
Time	24.0
Measurement	18.5
Fractions	16.7
Word Problems	15.8
Mental Computation	8.6
Numerical Reasoning	7.8
Geometry	6.5
Missing Elements	5.7

placed upon functional mathematical skills in the areas of money (28 percent), time (24 percent), and measurement (19 percent).

The number of sessions attended was correlated with both the number of skills mastered (r = .34) and the percentage of IEP goals achieved (r = .34); it was negatively correlated (r = -.20) with the rate of achievement. That is, the greater the number of sessions attended the slower the rate of achievement. The percentages of variance accounted for by sessions attended were 12 percent for both total skills mastered and percentage of skills mastered, and four percent for rate of achievement.

Age showed weak inverse relationships with total skills mastered (r = -.16) and percentage of IEP skills mastered (r = -.10); the percentages of shared variance were three percent for the former and one percent for the latter. There was no relationship between age and rate of mastery.

Differences in Achievement Among the Six Regions

Notable variations in three measures of achievement (i.e., percentage of population attaining the criterion, mean total skills mastered, and mean rate of mastery) were observed among the six special-education regions (see Table 30). Brooklyn West and Queens had the largest percentages of students attaining the five-skill criterion; 89.1 percent for the former and 83.7 percent for the latter. Five of the six regions met the program objective (i.e., at least 75 percent of the students mastered at least five new skills). Queens and Brooklyn West also showed the highest adjusted mean skills mastered (8.3 for the former and 8.0 for the latter); Manhattan had an adjusted mean of 7.9. The Bronx students showed the

TABLE 30

BREAKDOWN OF THREE ACHIEVEMENT MEASURES
BY REGION

	Bronx	Queens	Brooklyn West	Brooklyn East	Manhattan	Staten Island
Number of Students	1119	613	611	587	566	183
Percentage Attaining Criterion	60.9%	83.7%	89.1%	77%	74.4%	74.4%
Mean Total Mastery	5.7 (5.6)	8.4 (8.3)	7.9 (8.0)	7.2 (7.2)	7.7 (7.9)	7.6 (6.9)
Mean Rate of Mastery	10.4 (10.1)	6.6 (5.8)	5.5 (6.7)	7.5 (8.1)	5.5 (6.9)	9.9 (4.8)

lowest adjusted mean skills mastered (5.6). Staten Island exhibited the best adjusted mean rate of mastery (4.8 sessions per skill) among the regions. It should be noted, however, that the actual (unadjusted) rate for Staten Island (9.9 sessions) ranked fifth among the six regions. This discrepancy between adjusted and actual rates was accounted for by the inverse relationship between mastery rate and sessions attended (i.e., the deceleration of mastery rate at the high end of the distribution of sessions attended). The adjusted mean rate of mastery for the Bronx showed the poorest ratio (10.4 sessions per skill).

Differences in Achievement Among Disability Groups

Table 31 presents a breakdown of the three achievement measures by the five disability groups that comprised most of the model's population: EMR, SLD, EH, NI, and NIEH. Three groups met or exceeded the criterion for the program objective: at least five skills were mastered by at least 75 percent of the EH, NI, and NIEH students. The NIEH and NI groups had the highest percentage of students attaining the five-skill criterion: 80.6 percent and 79.3 percent, respectively. Under 65 percent of the EMRs achieved the five-skill level. The adjusted mean total skills mastered was 7.5 for the NI, NIEH, and SLD groups; the adjusted mean for EMRs was 6.3. Similarly, the best adjusted mean rates of mastery were achieved by the NIEH and NI groups: 6.5 and 6.7 sessions per skill, respectively; the adjusted mean rate of mastery for the EMR students was ten sessions per skill.

TABLE 31

BREAKDOWN OF THREE ACHIEVEMENT
BY DISABILITY

	EMR	SLD	EH	NI	NIEH
Number of Students	547	172	476	1141	285
Percentage Attaining Criterion	64.5%	70.3%	74.7%	79.3%	80.6%
Mean Total Mastery	6.2 (6.3)	7.4 (7.5)	7.0 (7.1)	7.6 (7.5)	7.5 (7.5)
Mean Rate of Mastery	9.4 (10.0)	7.7 (7.8)	7.3 (8.3)	7.5 (6.7)	6.2 (6.5)

X. AFTER-SCHOOL MODELS

The After-School Component consisted of five independent models designed to offer supplemental academic instruction to Title I-eligible handicapped students who were not enrolled in one of the reading or math models during the regular school day.

Although designed to operate throughout the school year, most of the models did not being until mid-March. The five models, each operating in one of five regions; were:

--Model A. Manhattan Peer Tutoring in Reading

--Model B. Queens Peer Tutoring in Reading

--Model C. Brooklyn East Reading Program

--Model D. Brooklyn West Creative-Writing Program

--Model E. Staten Island Math Program

Although these models differed in focus and scope, they had several features in common: (1) they were held after the regularly scheduled school day; (2) they provided a structured, individualized program of remediation for each student; and (3) they employed a diagnostic-prescriptive instructional methodology.

The After-School Models may be grouped, according to instructional organization, into two varieties: the Manhattan and Queens models employed a peer-tutoring approach; the other three were direct-service models. The following sections present, first for the peer-tutoring models and then for the direct-service models, a description of each model and the analyses of qualitative and quantitative data.

PEER-TUTORING AFTER-SCHOOL MODELS

Two of the After-School Models used the peer-tutoring approach: Model A, Manhattan Peer Tutoring in Reading and Model B, Queens Peer Tutoring in Reading. In these models, older handicapped students (i.e., at least 12 years of age), who received instruction from teacher/advisors, tutored younger handicapped students in specific reading skills. Descriptions of these models and the analyses of data collected to evaluate each are presented below.

Model A. Manhattan Peer Tutoring

This model employed a diagnostic-prescriptive, peer-tutoring methodology to remediate the reading skills of Title I-eligible handicapped students in the Manhattan Region. That is, mildly and moderately handicapped students tutored younger handicapped students in the acquisition of specific reading objectives which were established through the collection of baseline data on the Fountain Valley Reading System. The tutors also received reading instruction, based upon their performance on the Fountain Valley, from program teacher/advisors. The program objective proposed that, by June 1981, 75 percent of the tutees would master at least five new reading objectives as measured by the Fountain Valley; 60 percent of the tutors would master at least three.

Sessions were conducted in tutorial groupings of two tutees and one tutor supervised by a teacher/advisor. The target population of tutees was 200 Title I-eligible handicapped students aged five to 21; the tutors were 100 Title I-eligible handicapped students aged 14 to 21. Teacher/advisors prepared and designed structured, individualized programs

of remediation for each tutee and provided the tutors with materials and assistance needed to execute the learning plans. At each program site, a teacher/advisor supervised the work of twenty tutees and ten tutors. Tutor-tutee remediation sessions were conducted twice a week for one hour each session. The tutors met with the teacher/advisors one day a week to plan lesson plans and discuss problems. In addition, the tutors devoted one hour per week to the preparation of lessons and instructional materials.

Qualitative Evaluation. The Manhattan Peer-Tutoring Model was housed in regular classrooms and resource rooms. Most teacher/advisors were placed in the same schools that they served during the regular school day. In this way, they had access to rooms and storage space. Most of the teacher/advisors were Title I reading teachers during the regular school day; some had previous experience in tutoring programs, and most had some special-education experience. All expressed the conviction that the peer-tutoring model was an effective approach for promoting the academic and emotional development of handicapped students.

The classroom atmosphere, in all cases, was quiet, with students generally working diligently. Materials were displayed in a neat, organized, and accessible manner. Pupil work areas were well-defined so that tutor-tutee groups could work effectively.

Teachers generally expressed surprise and satisfaction at the quantity of materials provided for the program. The teachers, for the most part, agreed that the workbooks selected for the program were suitable for individualized instruction and the remediation of specific skills and were appropriate for meeting the needs of the target students. Obser-

vations indicated that most tutors were able to locate independently workbook pages for remediation of a specific skill and to deal effectively with tutee responses and needs. In one case, to prepare the tutors for their job, a teacher had them role play the tutoring situation; in this way they acquired a feeling and appreciation for the emotional set and responses styles of the tutees.

Tutors worked with tutees for approximately two hours each session. In some cases the instructional sessions were held twice a week, in others once a week. While tutorial groups worked, the teachers in charge maintained discipline, provided encouragement, guided choices of materials, and gauged student progress. In some cases the teachers had to mark answer sheets because tutors were unable to do so. Tutors met with teachers in charge on Tuesdays to set up lesson plans and discuss the operation of the program.

Maintenance of planbooks varied greatly. In most cases there were gaps in plans; many sessions were missing, many plans listed aims but not materials, and/or comments were missing. Interviews with the teachers revealed that the precision of the lesson plans and the amount of teacher input varied according to the abilities of the tutors. In all cases, the continuity of lesson plans seemed to be hampered by the uneven attendance of tutees. Nevertheless, tutors did seem to consult the pupil folders and planbooks or lesson plans before working with their tutees, and to use them as a guide for action.

Although the attendance of the tutors was generally regular, that of the tutees left much to be desired. The salaries paid to the tutors probably

tutors probably contributed to their high attendance rate. According to the teachers, this was the first real job for most of these students. Foremost among teacher complaints seemed to be the long delays in tutor payment. This was seen as demoralizing and endangering their motivational commitment toward the program. Many teachers felt that these delays might hamper the employment of tutors for future replications of this model.

The teachers also maintained that after-school jobs, half-days, and, suspensions negatively affected attendance in this after-school model.

In addition, it was generally expressed that more care should be exercised in the selection and pairing of tutors and tutees. The teachers indicated that consideration should be given to the skill levels of tutors and tutees, their responsiblity and motivation, their behavior and the compatibility of tutors and tutees. Frequently, because of the uneven capabilities of tutors and tutees, it was difficult to plan work appropriate for both students of a tutorial dyad.

Furthermore, it was suggested that increased communication between staff of this after-school model and the day-school teachers was needed to better coordinate instructional services for these students.

Interviews with the tutors revealed that, in most cases, they were quite pleased with their roles and performances. They greatly appreciated the program and were satisfied that they had helped their tutees master reading skills.

Teachers agreed that regardless of the academic benefits or success of the program, the emotional boost it provided both the tutors and tutees probably had a facilitating effect upon their motivation and, consequently, academic achievement.

Quantitative Evaluation. Data were submitted for 134 students, including tutors and tutees. Of these, 8 were truant, 6 were discharged, and 17 were late admissions. Therefore, complete achievement data were reported for 100 students (74.6 percent).

The age range of the population was between eight and 19 years; the mean was 14.4 years, and the mode was 16.0 years. Twenty-one percent attended day classes in elementary schools; 56 percent were in intermediate and junior high schools; 23 percent were in high schools.

The three principal disability groups represented were: NI, 67.2 percent; EMR, 13.4 percent; and EH, 13.4 percent.

Sixty-two percent of these students attended the program three sessions per week; 23 percent were scheduled for two sessions per week, and 15 percent were scheduled for one. For 94 percent of the population, session length was two hours.

The total number of sessions attended ranged from five to 45, with a mean of 22.3, a median of 17.1, and a mode of 45.0. Mean percentage attendance was 65.1 percent.

The objective of this model was that 75 percent of the tutees would master five objectives in reading, and 60 percent of the tutors would master three objectives in reading. A coding error precluded separate

analysis of these data for tutors and tutees. Therefore, the achievement data were analyzed for all students as a group.

Table 32 presents the frequency distribution of total reading skills mastered for the total population of 100 students. Thirty-nine percent of these student mastered five or more skills. Since two-thirds of the sample were tutees and it was proposed that 75 percent of the tutees would master at least five skills, it would be expected that, if the program objective was attained, approximately 50 percent of the total population would have mastered five objectives (i.e., 67 percent x 75 percent = 50 percent). Since the observed value (39 percent) is less than the expected (proposed) value, it was concluded that the criterion for tutees was not attained. Although the data, with respect to the tutors, are equivocal (73 percent of the total sample mastered at least three new skills), it would appear highly probable that the criterion for this group was attained. The mode for the total student sample was four skills mastered, a level attained by 21 percent of the students. The mean percentage of short-term goals attempted and achieved, as listed in each student's IEP, was 65.1 percent; the percentage of goals attempted and failed was 12.6 percent; 22.3 percent of the goals were not attempted.

A Pearson product-moment correlation coefficient of .42 ($\underline{r}^2 = .18$) was attained between number of sessions attended and number of skills mastered; correlation between the former and percentage of objectives mastered was .39 ($\underline{r}^2 = .15$). Age was weakly related to the percentage of mastery ($\underline{r} = .08$) but moderately related to total skills mastered ($\underline{r} = .23$; $\underline{r}^2 = .05$). Thus, the older students, the tutors, tended to master more new skills than the younger students, the tutees.

TABLE 32

FREQUENCY DISTRIBUTION OF THE NUMBER OF TOTAL READING SKILLS MASTERED BY THE MANHATTAN AFTER-SCHOOL TUTORS AND TUTEES

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
9	1	1.0	1.0
8	4	4.0	6.0
7	6	6.0	11.0
6	10	10.0	21.0
5	18	18.0	39.0
4	21	21.0	60.0
3	13	13.0	73.0
2	16	16.0	89.0
1	9	9.0	98.0
0	2	2.0	100.0

Model B. Queens Peer Tutoring in Reading

This model was similar to the Manhattan Model in format and objectives; however, the tutoring was administered in the tutees' homes. The model was designed to serve 100 Title I-eligible handicapped students (both tutors and tutees). The tutees could not travel independently. Tutoring was scheduled for one hour per day, twice a week, in the presence of a parent or designee.

Qualitative Evaluation. Field consultants observed teacher-tutor training sessions which were conducted in program-assigned high schools. Emphasis was placed upon the importance of being a professional, both in terms of job performance and interpersonal skills. Some sessions focused upon specific reading content areas and techniques; others were addressed to administrative matters. Tutors and teachers appeared to be involved and interested in the training; excellent rapport was observed between them.

The observation of the tutor-tutee interactions took place in homes of the tutees. Typically, the tutees were given a vocabulary test, then asked to complete exercises and/or read from a prescribed book or other material. Tutors were observed to utilize the suggestions given to them by the teachers to improve motivation. Parental support was shown by the provision, in most cases, of a quiet area in the home where a session could be conducted in a relatively undisturbed manner.

Interviews revealed that, while teachers felt that this was a worthwhile program, they believed as did the teachers of the Manhattan Peer-Tutoring model, that more care should have been exercised in the screen-

ing and the selection of tutors. Further, delays in the processing of tutors and the payment of their salaries resulted in low morale and motivation which, in some cases, impaired their performance. In addition, in some cases, tutors had to travel as much as two hours for an hour of tutoring, earning $3.35 and spending $1.50 in transportation. Many tutors felt that this was not enough compensation for their time and effort and indicated a reluctance to participate in possible replications of the program.

Quantitative Evaluation. Data were submitted for two distinct groups of students--the tutors and the tutees. The analyses of these data are presented below in two sections: the first section presents the findings for the tutors; the second presents the findings for the tutees.

It should be noted that 43 students began this program either as tutors or tutees. Because of truancy (six students or 14.0 percent), discharges (one or 2.3 percent), and late admissions (five or 11.6 percent), complete data were submitted for only 31 (72 percent).

Tutors Complete achievement data were submitted for 18 tutors; all were in high school. Each tutor was involved in five one-hour program sessions per week: four tutoring sessions and one training session. The total number of sessions served ranged from 39 to 75; the mean was 62.5, the median was 68.2, and the mode was 68.0. The mean percentage of attendance was 78.3 percent. The disabilities which characterized the tutors were EH (44.4 percent), NI (33.3 percent), and EMR (16.7 percent).

The objective of this program for the tutors was that 60 percent

would master at least three new skills in reading as measured by the Fountain Valley Reading System. Table 33 presents the frequency distribution of total skills mastered for this group. Since almost 78 percent mastered at least three new skills, the objectives was attained. The maximum number of skills mastered was eight, achieved by one student. Only two of the 18 tutors failed to show any mastery.

The mean percentage of short-term goals listed in each tutor's IEP that were mastered was 57.1 percent; the failure rate was 22.1 percent; the percentage of those goals not attempted was 20.8 percent. The reading components in which most skills mastery occurred were vocabulary (61.1 percent of the students) and comprehension (55.6 percent).

Tutees There were 13 tutees for whom complete data were available. Of these two were at the elementary school level, two at the intermediate level, and nine at the high school level. Eleven tutees received two one-hour sessions a week, while two received four one-hour sessions a week. The age range of these students was eight to 14 with a mean of 10.4 years. Disabling conditions were NI (53.8 percent), EH (30.8 percent), and EMR (7.7 percent). Total sessions received ranged from nine to 24, with a mean of 17.4, a median of 19.5, and a mode of 20.0.

The objective for the tutees was that 75 percent would master at least five new reading skills as measured by the Fountain Valley. Table 34 presents the frequency distribution of skills mastered for the tutees. Only 30.8 percent attained the five-skill criterion. Hence, the objective was not met. The probable cause of this shortfall was the low mean sessions attended observed for tutees. While

TABLE 33

FREQUENCY DISTRIBUTION OF TOTAL READING SKILLS MASTERED BY THE QUEENS AFTER-SCHOOL TUTORS (AS MEASURED BY THE FOUNTAIN VALLEY)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
8	1	5.6	5.6
7	2	11.1	16.7
6	2	11.1	27.8
5	2	11.1	38.9
4	4	22.2	61.1
3	3	16.7	77.8
2	2	11.1	88.9
1	2	11.1	100.0
	18		

TABLE 34

FREQUENCY DISTRIBUTION OF TOTAL READING SKILLS MASTERED BY THE QUEENS AFTER-SCHOOL TUTEES (AS MEASURED BY THE FOUNTAIN VALLEY)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
7	1	7.7	7.7
6	1	7.7	15.4
5	2	15.4	30.8
4	4	30.8	61.6
3	2	15.4	77.0
2	1	7.7	84.7
0	2	15.4	100.1
	13		

the tutors attended an average of almost 63 sessions, the tutees attended an average of 17.

Of the short-term goals listed in each student's IEP, 53.0 percent were achieved, 25.8 percent were failed, and 21.2 percent were not attempted.

DIRECT-SERVICE AFTER-SCHOOL MODELS

There were three after-school models that used a direct-services approach (i.e., teachers directly taught students): Model C, Brooklyn East Reading; Model D, Brooklyn West Creative Writing, and Model F, Staten Island Math. Each of these models was designed to provide compensatory education to 100 Title I-eligible handicapped students who could travel independently and were not served in any of the Umbrella's regular-day models. The students attended these models twice a week for one hour per session to receive remediation in the academic area indicated by the title of each model. All three employed the individualized diagnostic-prescriptive methodology. Since the analyses of the qualitative data for these three models revealed large commonalities the findings are presented below in a single section.

Qualitative Evaluation

Instruction was provided in regular classrooms and resource rooms. Observations revealed that, although some rooms (particularly in Brooklyn East) had poor lighting, were not clean, and, in general, did not provide a pleasant work atmosphere, most sites in all three models were well-organized and adequately stocked with supplies. Student folders

were up-to-date, containing the results of diagnostic testing, work samples, and follow-up testing. Although few IEPs were in evidence, the after-school teachers indicated that they were in communication with their student's day-school teachers to ensure the continuity of instruction. Indeed, the creative-writing teachers consulted with the regular day-school teachers in developing lesson plans.

Observations of the Brooklyn East Model showed that, in addition to general reading skills, lessons were focused on functional skills (e.g., filling out social security forms and job applications). The creative-writing lessons in Brooklyn West were focused upon mechanical skills (e.g., punctuation and grammar) and the construction of original compositions.

It is noteworthy that most of the after-school teachers reported that the relaxed atmosphere of the after-school models resulted in enhanced student motivation and, consequently, meaningful academic development.

Quantitative Evaluation

Findings based upon the analyses of attendance and achievement data are presented below separately for each of the three direct-service after-school models.

Model C. Brooklyn East Reading. One hundred twenty-nine students were served at eleven sites. Of these, two were truant, two were discharged, and three were late admissions. Thus, complete achievement data were submitted for 122 students (94.6 percent).

These students ranged in age from nine to 20 years, with a mean of 14. More than 32 percent attended elementary day schools, 21 percent attended intermediate or junior high schools, and 32 percent attended high schools. The incidence of specific disabilities among the population was as follows: NI, 58.9 percent; EMR, 13.2 percent, NIEH, 8.5 percent; and SLD, 6.2 percent.

The mean percentage attendance for the total population was 73.6 percent. Total sessions attended varied from zero to 32 sessions; the mean was 15.9 sessions and the mode was 12 sessions.

The objective of this model was that 75 percent of the students would master at least three new skills, as measured by the ICRT. Table 35 presents the frequency distribution of total skills mastered. Three or more skills were mastered by 43.4 percent of the students; at least two skills were mastered by 76.2 percent. Thus, the objective was not attained. It is notable, however, that the mode (three skills) was equal to the three-skill criterion. The mean number of skills mastered was 2.2. Most of the skills mastered were in the area of comprehension: 70 percent of the students mastered at least one skill in this area.

There were high correlations between total sessions attended and both total skills mastered (r = .60, r^2 = .36) and percentage of IEP skills mastered (r = .43, r^2 = .18). Moderate inverse correlations were observed between age and both total skills mastered (r = -.31, r^2 = .10) and percentage of mastery (r = -.34, r^2 = .12). That is, the younger students tended to learn both more skills and a greater percentage of their short-term IEP goals than did the older students.

TABLE 35

FREQUENCY DISTRIBUTION OF TOTAL READING SKILLS
MASTERED BY THE BROOKLYN EAST AFTER-SCHOOL STUDENTS
(AS MEASURED BY THE ICRT)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
5	1	0.8	0.8
4	9	7.4	8.2
3	43	35.2	43.4
2	40	32.8	76.2
1	15	12.3	88.5
0	14	11.5	100.0
	122		

Model D. Brooklyn West Creative Writing. This model served 104 students. Of these, 30 students were truants or low attenders (28.8 percent), nine were discharged, and six were late admissions. Thus, complete achievement data were reported for 59 students (56.7 percent).

These students ranged in age from eight to 19, with a mean of 13.5 years. Thirty-one percent attended elementary day schools, 48 percent attended intermediate and junior high schools, and 21 percent were in high school. The disabilities represented were: EH, 28.8 percent; NI, 25 percent; EMR, 20.2 percent; and SLD, 12.5 percent.

Excluding traunts, discharges, and late admissions, the mean percentage attendance was 79 percent. These students attended an average of 21.5 sessions; the median was 22 and the mode was 13.

The objective of the program was that 75 percent of the students would master at least one new writing skill, as measured by the Readers' Digest Writing Test. Table 36 presents the frequency distribution of writing skills mastered. These data indicated that the objective was easily surpassed: all of the students mastered no fewer than two new skills. Indeed, more than half of the students mastered at least six new skills. The range of mastery was between two and twelve skills. As observed in Table 37, the percentage of students mastering skills in specific writing components, most of the students mastered skills in the mechanics of writing: simple sentences were mastered by 86.4 percent of the students; paragraphs by 64.4 percent; and words by 44.1 percent. Letter writing, a skill involving both mechanical and creative elements, was mastered by 23.7 percent.

TABLE 36

FREQUENCY DISTRIBUTION OF THE TOTAL NUMBER OF WRITING SKILLS MASTERED BY THE BROOKLYN WEST AFTER-SCHOOL STUDENTS (AS MEASURED BY THE READERS' DIGEST WRITING TEST)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
12	3	5.1	5.1
11	3	5.1	10.2
10	3	5.1	15.3
9	4	6.8	22.1
8	6	10.2	32.3
7	4	6.8	39.1
6	8	13.6	52.7
5	17	28.8	81.5
4	6	10.0	91.5
3	4	6.8	98.3
2	1	1.7	100.0
	59		

TABLE 37

THE PERCENTAGE OF STUDENTS IN THE CREATIVE-WRITING MODEL MASTERING SKILLS BY TOPICS

Topic	Percentage Achievement
Simple Sentences	86.4
Paragraphs	64.4
Words	44.1
Letter Writing	23.7
Punctuation	22
Complex Sentences	16.9
Essay	5.1
Poem	1.7

Of the short-term goals listed in each student's IEP, 85.5 percent were mastered, 14.2 percent were failed, and 0.3 percent were not attempted.

Model E. Staten Island Math. This model served 50 elementary-school students ranging in age from seven to 12; the mean age was 9.5 years. The students were classified in the following disability groups: twenty-six (66.7 percent) of the children were SLD; two (5.1 percent) were EH, seven (12.8 percent) were NI; and six (15.4 percent) were NIEH.

The prepared schedule of the model was modified so that the students attended one two-hour session per week rather than two one-hour sessions. Total sessions attended ranged from two to eleven; the mean was 7.9, and the mode was nine sessions. The mean percentage attendance was 72.6 percent.

The objective proposed that 75 percent of the students would master at least three new skills in math, as measured by the Key Math Test. Table 38, the frequency distribution of total skills mastered, showed that only 38.6 percent of the students attained the three-skill criterion; the mode was two skills, achieved by one-quarter of the population. Thus, the objective was not met.

The areas in which most of the mastery occurred were: subtraction (38.5 percent of the students), a basic computational skill; numbers (35.9 percent), a basic conceptual skill; and time (28.2 percent), a functional skill.

Of the short-term goals listed in each student's IEP, 55.7 percent were mastered, 35.9 percent were failed, and 8.4 percent were not attempted.

TABLE 38

FREQUENCY DISTRIBUTION OF THE TOTAL NUMBER OF MATH SKILLS MASTERED BY THE STATEN-ISLAND AFTER-SCHOOL STUDENTS (AS MEASURED BY THE KEY MATH TEST)

Number of Skills Mastered	Number of Students	Relative Percentage	Cumulative Percentage
8	1	2.6	2.6
7	3	7.7	10.3
6	1	2.6	12.9
5	1	2.6	15.5
4	3	7.7	23.2
3	6	15.4	38.6
2	10	25.6	64.2
1	6	15.4	79.6
0	8	20.5	100.1
	39		

XI. CONCLUSIONS AND RECOMMENDATIONS

The Title I Umbrella for the handicapped provided compensatory education in reading and mathematics to approximately 21,000 students and 3,300 students, respectively, through eight school-day models and five after-school models. The quantitative evaluation of the Umbrella indicated that six of the seven school-day models for the remediation of reading skills attained their proposed objectives; one of the two school-day models for the remediation of mathematics skills attained its objective. Overall, 75 percent of the population of the Umbrella attained the criteria for their respective models in reading ; 72 percent achieved the same in math. Specifically, the findings for the school-day models indicate the following:

-- although at the time of data collection 71 percent (compared to the goal of 75 percent) of the students in the Prescriptive Reading Model (which served approximately 70 percent of the Umbrella's population) had attained the five-skill criterion, it was projected that, at the end of the funding year, the model's objective would have been achieved;

-- the proposed reading objectives for the LTRTA, Bridge to School, and Non-Public Schools Models were surpassed;

-- while approximately 45 percent of the students of the Bilingual Model had, as a result of late admissions, incomplete data, the program objective was attained for those students who attended the full year;

-- the objectives for the Special-Schools Model were attained in reading and writing, but not in mathematics;

-- the objective for the Prescriptive Math Model was attained at the proposed criterion level; and

-- the objective for the Oral Approach to Communication Model was not attained.

The Umbrella was expanded at mid-year to include five after-school models: two employed a peer-tutoring approach; three were direct-service models. The peer-tutoring models in the Manhattan and Queens Regions achieved their reading objectives for the groups of tutors; the objectives for the tutees, however, were not attained. Only one of the direct-service after-school models (Model D, Brooklyn West Creative Writing) attained its objective. The objectives were not attained for Model C, Brooklyn East Reading, and Model E, Staten Island Math.

Based upon these findings, the overall conclusion of this evaluation is that, for the most part, the school-day models of the Title I Umbrella for the handicapped provided an effective program of compensatory education that advanced the specific reading and math skills of the target population. On the other hand, the after-school models, with the exception of Model D, Brooklyn West Creative Writing, were plagued with problems in planning and implementation that detracted from their effectiveness. The conclusions and recommendations for the school-day and after-school models are discussed in detail separately in the following sections.

SCHOOL-DAY MODELS

The conclusions of this evaluation apply, with a few exceptions, to all of the school-day models. As indicated above, the overall conclusion is that these models provided effective remediation resulting in the mastery of specific reading and math skills by the target population. This conclusion is supported not only by the attainment of the proposed objectives for most of these models, but also by the strong correlations observed between program attendance and the mastery of specific skills.

The succcess of these models is largely attributable to the effective planning and implementation of their diagnostic-prescriptive methodology. The teachers--both experienced and inexperienced--were well-prepared, through orientation and in-service training, for the collection of baseline data and the employment of these data for the formulation of individual educational plans suited to the needs of each student. Classroom observations revealed, and the inspection of planbooks and records confirmed, that instruction was highly individualized and systematically planned and monitored.

A further contribution to the success of these models was the abundance and, for the most part, timely delivery of instructional supplies and materials. With the few exceptions noted below, a wide variety of materials were on hand to provide the students with stimulating vehicles for learning through a multisensory approach.

In addition, innovative instructional strategies were presented to the program teachers and paraprofessionals through an effective in-service training program. This was particularly vital since many of these personnel had limited experience in both special and remedial education.

Perhaps most important was the sincerity, dedication, and ability demonstrated by most of the program's teachers. While planning, methodology, and administration are certainly vital, a program's success is ultimately dependent upon the skills and motivation of the implementors (the teachers); these teachers evinced both qualities.

Notable for its innovative approach was the LTRTA model. The integration of arts experiences and remedial reading proved to be both motivationally and educationally effective.

Qualitative and quantitative analysis uncovered several areas where improvement might result in enhanced pupil gains. While it is recognized that several of these areas are beyond the control of the program's administration, they are nevertheless mentioned as contextual limitations in which the program operated. One limitation involved the basic structure of most of these models: the pull-out approach. The logistics required for the programming of students for these pull-out models and the concomitant disruption of regular classroom instruction, frequently resulted in the estrangement of program teachers from regular-class teachers and administrators. An undesirable by-product was a lack of communication between remedial and regular-class teachers which interfered with the coordination of instructional planning and activities.

The lack of parent involvement (often at the option of the parent) inhibited the coordination of extra-school activities to reinforce remedial instruction.

The facilities allocated to the models were, in many cases, inadequate and inappropriate for effective instruction. At many sites instruction was provided in storage closets, teachers' lounges, auditoriums, or even shop classrooms. None of these facilities is conducive to effective remediation.

Although a well-organized in-service training program was provided, many teachers indicated that they were inexperienced in both special- and remedial-education and not sufficiently prepared to implement the program.

Several limitations were noted with respect to the Special-Schools Model. Some of the sites, particularly the hospital schools, had a highly transient population. The constant turnover of students made it extremely difficult to maintain a coordinated, structured, and continuous program of remediation. It appeared that these services could have been more productively applied to other sites.

The Special-Schools Model was also limited by the allocation of instructional supplies that did not motivate the students. Most of the Special-Schools students were adolescents and young adults with low-level reading skills. To maintain their interest in learning it is essential that instructors use low level/high interest materials. These were not in evidence.

The Oral Communication Approach to Reading Model, which employed the Monterey Language Development Program, did not appear to promote meaningful mastery of reading skills. It is quite possible that significant growth might have been observed on a test of expressive-language competency. However, the criterion-referenced reading instrument employed in this evaluation did not demonstrate attainment of the proposed objective.

Although the Bilingual Model attained its objective, the large number of late admissions suggested that the model had start-up problems. These delays truncated instructional time for 45 percent of the model's students.

Finally, direct instructional time for all these models appeared to be reduced by burdensome and, in some cases, redundant administrative paperwork.

Recommendations

Based upon the aforementioned conclusions and the analyses of data presented in this report, the following recommendations are offered.

-- The diagnostic-prescriptive approach ought to be continued in the remediation of reading, mathematics, and writing skills.

-- The in-service training component ought to be continued and, indeed, expanded to provide hands-on training in the use of specific materials and techniques. Moreover, more intensive preparation at the beginning of the program ought to be given to inexperienced teachers.

-- An alternative instructional paradigm to the pull-out model ought to be investigated. Alternative models should involve simultaneous full-class participation.

-- Consideration should be given to expanding the LTRTA Model. In addition, the investigation of other innovative techniques for groups of students that have not responded to previously implemented programs might lead to improved performance.

-- Instructional strategies alternative to that employed in the Oral Approach to Communication Model ought to be explored. The latter, although perhaps affecting expressive language competency, was not shown to promote meaningful gains in reading.

-- Remediation should not be applied to transient populations; this is not a productive use of resources.

-- High interest/low level materials are needed for older eligible students. In addition, teachers should be consulted in the selection of instructional materials.

-- There is a need for more consultation between remedial-reading and classroom teachers to plan an integrated program of instructional services for each student.

-- More intensive planning and organization is needed for the Bilingual Model so that these students may receive the full benefit of the program.

-- Efforts should be made to reduce the amount of administrative paperwork.

AFTER-SCHOOL MODELS

As indicated above, the overall conclusion of the evaluation of the after-school models is that, except for gains demonstrated by the tutors of the Manhattan and Queens Models and the students in the Brooklyn West Creative Writing Model, the objectives for the after-school models were not attained.

Although the concept of after-school remediation of handicapped students is theoretically appealing, in reality these models were impaired by several logistical and organizational problems. Many of these problems are attributable to late program start-up and the concomitant lack of time for planning; others appear to be inherent in the conceptual framework underlying these models.

Due to the late start-up date, it was difficult to find qualified personnel. Many of the models' teachers had no experience or training in the specific content areas in which they served (i.e., reading, creative writing, and math). Accordingly, instruction was not of the highest quality. Many teachers were unfamiliar with the materials and equipment and appeared not to use them optimally.

There appeared to be some discontinuity in the students' instructional programs (particularly in the reading models). The basic cause was lack of communication between the day-school and after-school teachers. This problem was exacerbated for those students who attended after-school programs in schools other than their day schools. Discontinuity was also attributable to excessive truancy.

Problems were encountered in securing the participation of the target population. Many students could not travel to the program independently and many parents were not eager to allow their children to attend an after-school program in a school other than their day-school site.

The tutors in the peer-tutoring models were not screened as carefully as they might have been. In addition, the remuneration received by the tutors was not commensurate (especially in the Queens Model) with the responsibilities

of their jobs. Often tutors had to travel over two hours to perform one hour to tutoring, spending $1.50 for carfare; their stipend for this task was $3.35 for the one hour of tutoring. Moreover, there were excessive delays in the payment of these tutors.

Recommendations

Overall, it would appear that, given the problems inherent in the implementation of these after-school models, the funds expended on them might be better spent in augmenting and improving the day-school models. However, if these models are replicated, adherence to the following recommendations might enhance their success.

-- More lead time for careful planning is essential to the development of an effective program and would alleviate many of the problems indicated above.

-- The teachers should be thoroughly experienced and trained in the content areas of their respective models.

-- Continuity of instruction would be improved if the students were served in their home schools and the after-school teachers had communication with the day-school teachers and access to students' IEPs.

-- Prior to the opening of a site, local need should be investigated to assure the existence of an appropriate target population.

-- If peer-tutoring is to be continued, tutors should be screened more carefully to confirm that they are both capable and motivated.

-- Tutors should have more work hours, get paid on time and, in the home-tutoring model, have less travel time or receive pay for excessive travel time.

-- The matching of tutors and tutees should be based upon a systematic assessment of their needs and abilities.

-- Since truancy tends to increase as the weather becomes warmer, it is recommended that the program run from October through mid-May.

-- As frequently as possible, the models should operate in resource rooms to take advantage of the large supply of materials and equipment.